MAY 29, 1961
Volume 50, No. 11

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OFFICIAL PUBLICATION OF THE PROCEEDINGS AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

AMERICAN DYESTUFF REPORTER

TEXTILE WET-PROCESSING

Blow the hand up!

WICASET WA-89 Balloons your fabric and bulks your goods without stiffening . . . cleaner cans and running ease declare extra dividends of a full, rich hand, added tear strength, crease recovery and abrasion resistance.

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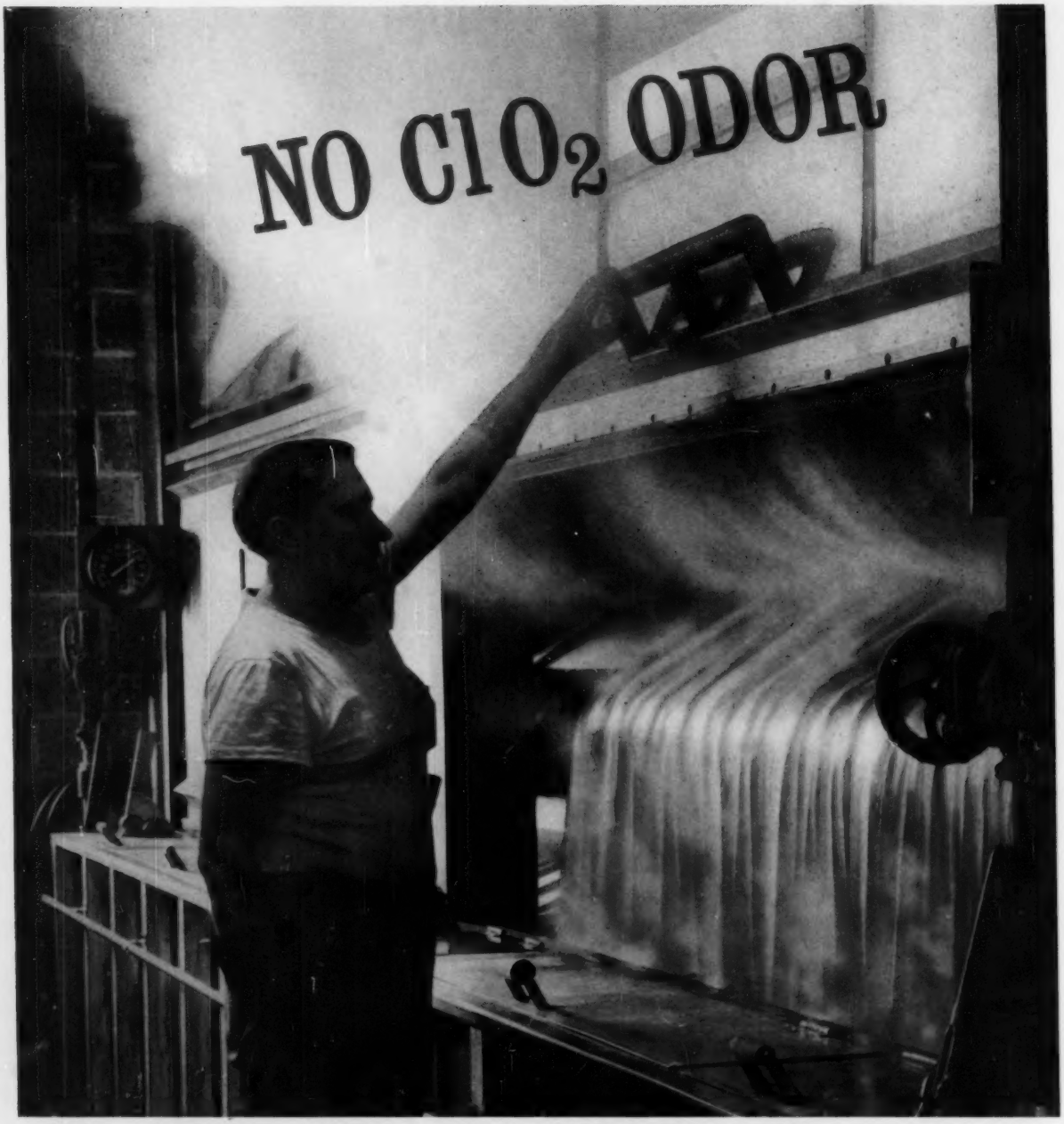

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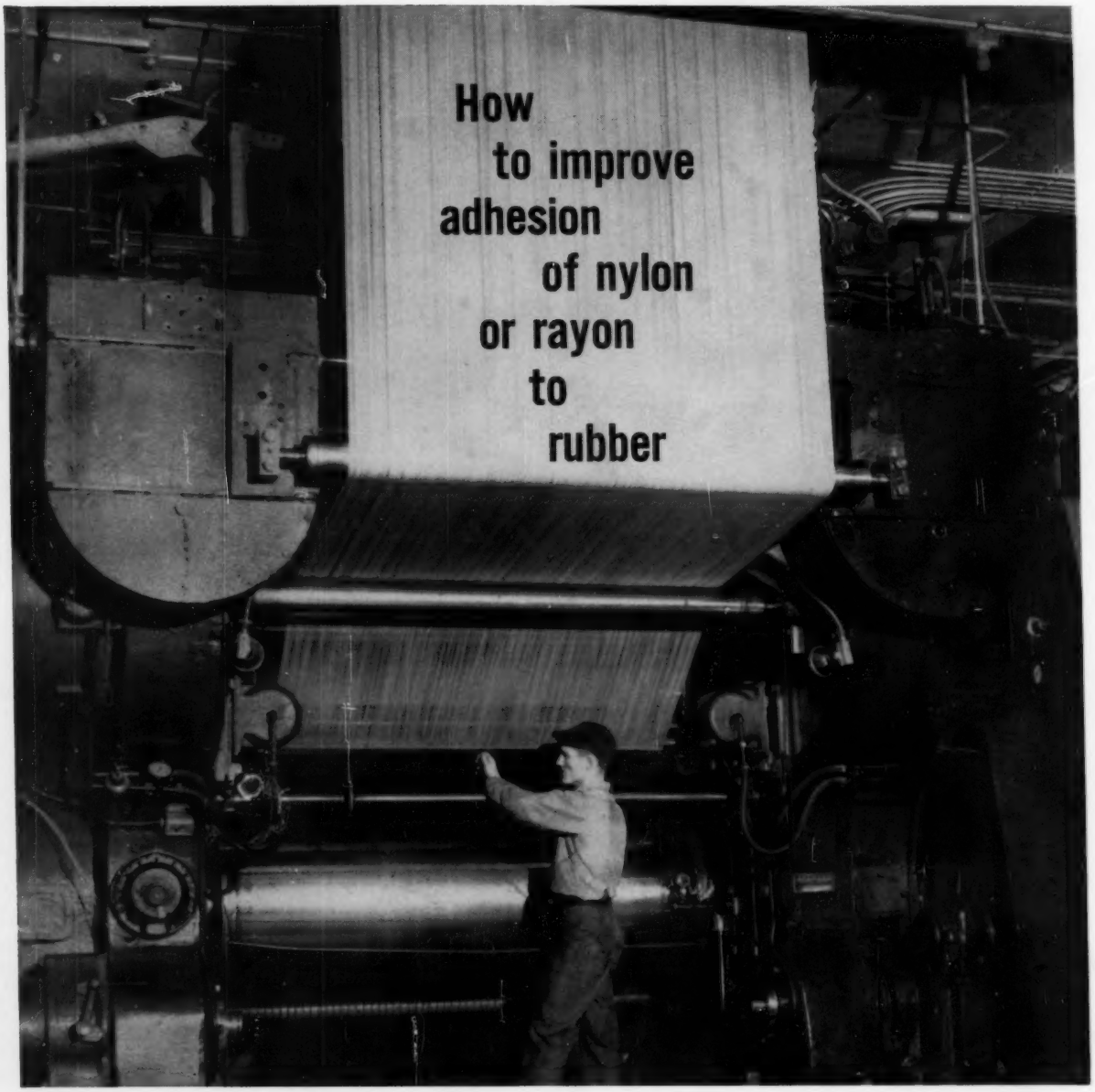

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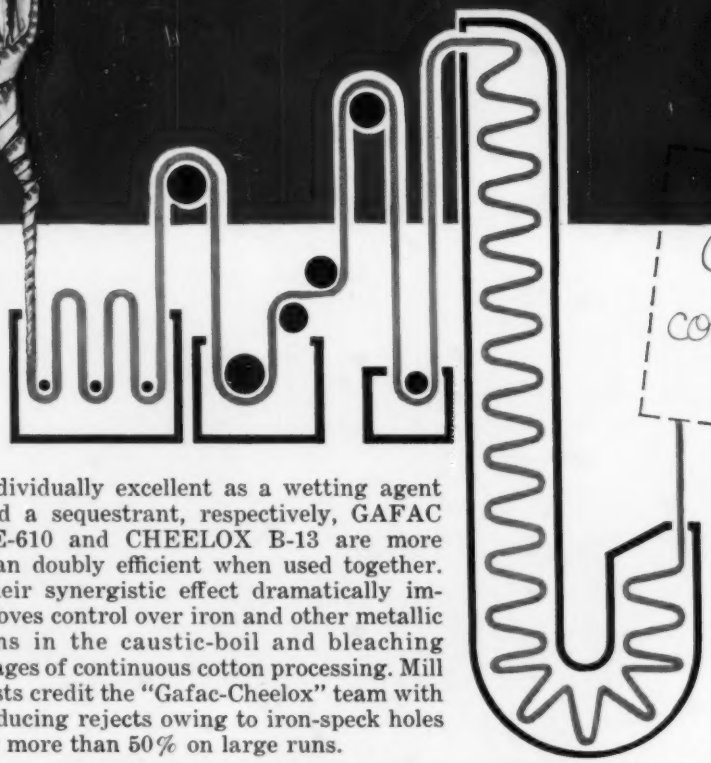

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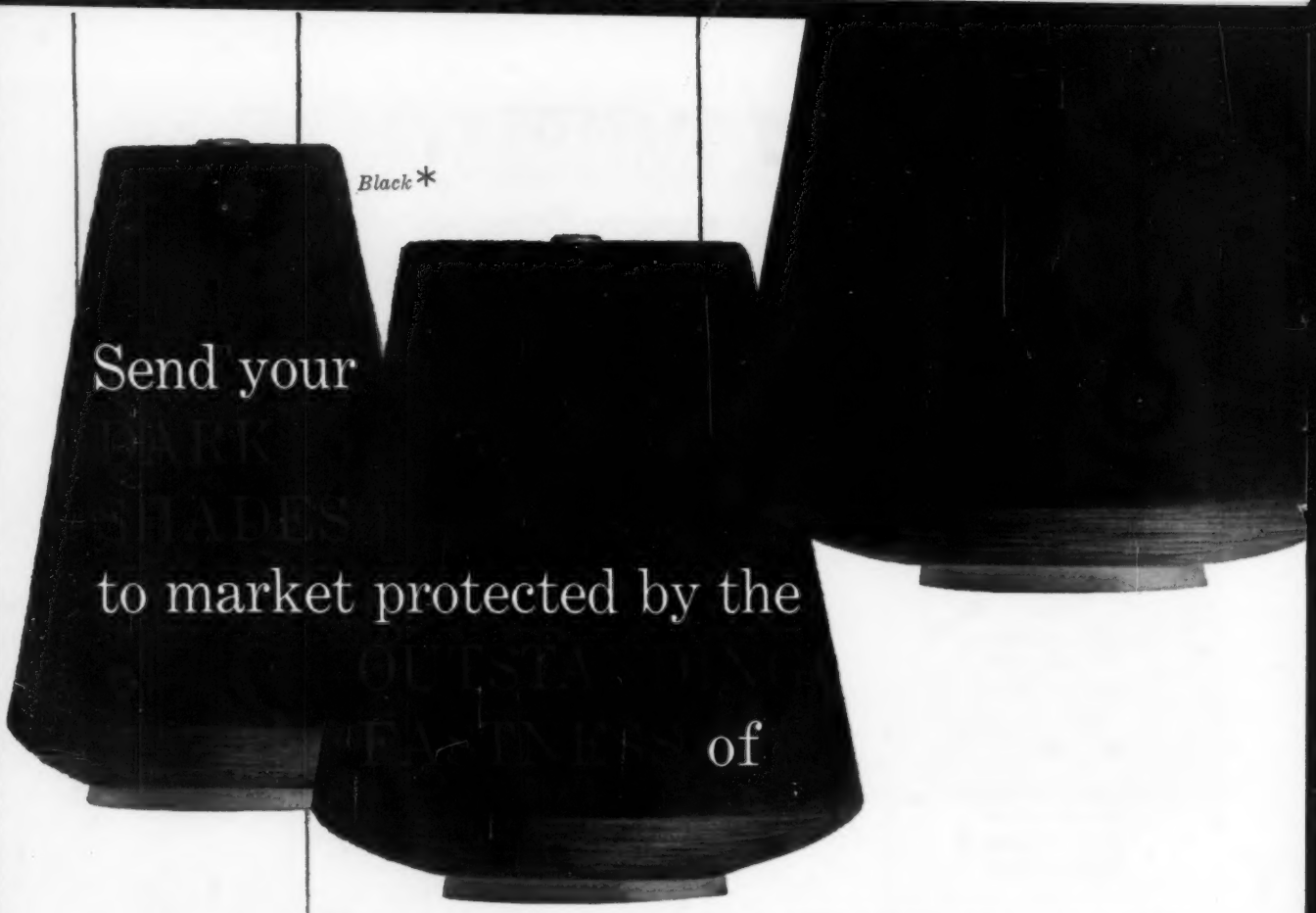

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REGIONAL MEETING IDEA TAKES HOLD

AN attendance of more than 350 at the recently concluded New England Regional Meeting of the American Association of Textile Chemists and Colorists, held at the Jug End Barn, South Egremont, Mass, more than fulfilled the expectations of the proponents of the meeting and gave a veritable "shot-in-the-arm" to all three of the participating New England Sections.

In an area where, it is generally conceded, the textile industry hasn't been at its healthiest, attendance at local section meetings has fallen off accordingly to a point where local section program chairmen have been having their problems, to put it mildly. However, continuing "testing at the grass roots" to determine the wants of local membership in each of the three sections has led to diversified programs designed to fulfill such wants, and the Regional Meeting is one such program that apparently has been met with enthusiastic response.

When queried as to what he thought of the Meeting, one of the registrants, a research and development executive at a New England mill, expressed the opinion that he found the program "very attractive". He pointed out that he was much more apt to attend a meeting where several technical papers are scheduled, three or four of which are of direct interest to him, than one which features only one or two papers, which "may or may not be of interest, depending on the topic". He also stated that his management "looked more favorably" on his attending a meeting where several papers are on the program, and actually encourages his attendance at such a meeting "even during a regular working day at the plant".

On the other side of the ledger, one of the speakers stated that he was impressed by the "quality and quantity" of his audience, which, despite the competing attractions of the Jug End Barn resort facilities, listened attentively and participated enthusiastically in the discussion after his presentation. He stated that he and his company would be most happy to subsidize his time and expense in the preparation of high-quality presentations if he could be assured of such a responsive audience in the future.

Neither comment appears to be negatively critical of local section programs as such, but each rather points to the positive advantage of regional meetings from time to time superimposed upon the regular program schedules of local sections. Succinctly, regional meetings offer to those attending a wider variety of subjects, and to those speaking, a larger and more responsive audience. The benefits to AATCC as a national association are obvious.

The idea of a regional meeting is not new, but the fruition of same is most significant. It is conceded that the "compactness" of the New England area, geographically, lends itself more readily to the idea, but it was noted also that some registrants at the New England meeting were from "outlying" areas, such as the Hudson-Mohawk and Metropolitan Sections, which may lead to fuller examination of the idea by the Central Atlantic and Southern Regions. The Western Region, by reason of its vast geographical expanse, might have greater difficulty in such a venture.

Local section meeting among the six sections of the Southern Region frequently are attended by many who are members of other sections, and it would appear that the "climate" is especially suitable for a Southern Regional Meeting.

In the Central Atlantic Region, frequent "visitations" on the part of Metropolitan and Delaware Valley Section members to each other's local section meetings are common, and, in fact, a joint meeting of the two sections was held in Trenton, NJ, a few years ago. Elsewhere in the Central Atlantic Region, the "partnership" of AATCC's Niagara Frontier Section and the Canadian Association of Textile Colourists and Chemists' Ontario Section has led to numerous joint meetings, and will find a large Canadian registration at this year's AATCC Convention in Buffalo, NY.

"States righters" would seem to have little to fear that regional meetings would adversely effect the autonomy and vigor of the local sections, for they would supplement rather than supplant local section programs. In fact, regional meetings would probably be impossible without the support and personal efforts of local section officers and members, for their effective sponsorship requires efforts fully as demanding as those involved in the sponsorship of a national convention.

Our congratulations to Robert D Robinson, chairman for the New England Regional Meeting, Robert H Phillips, vice chairman, and to the entire committee for its success.

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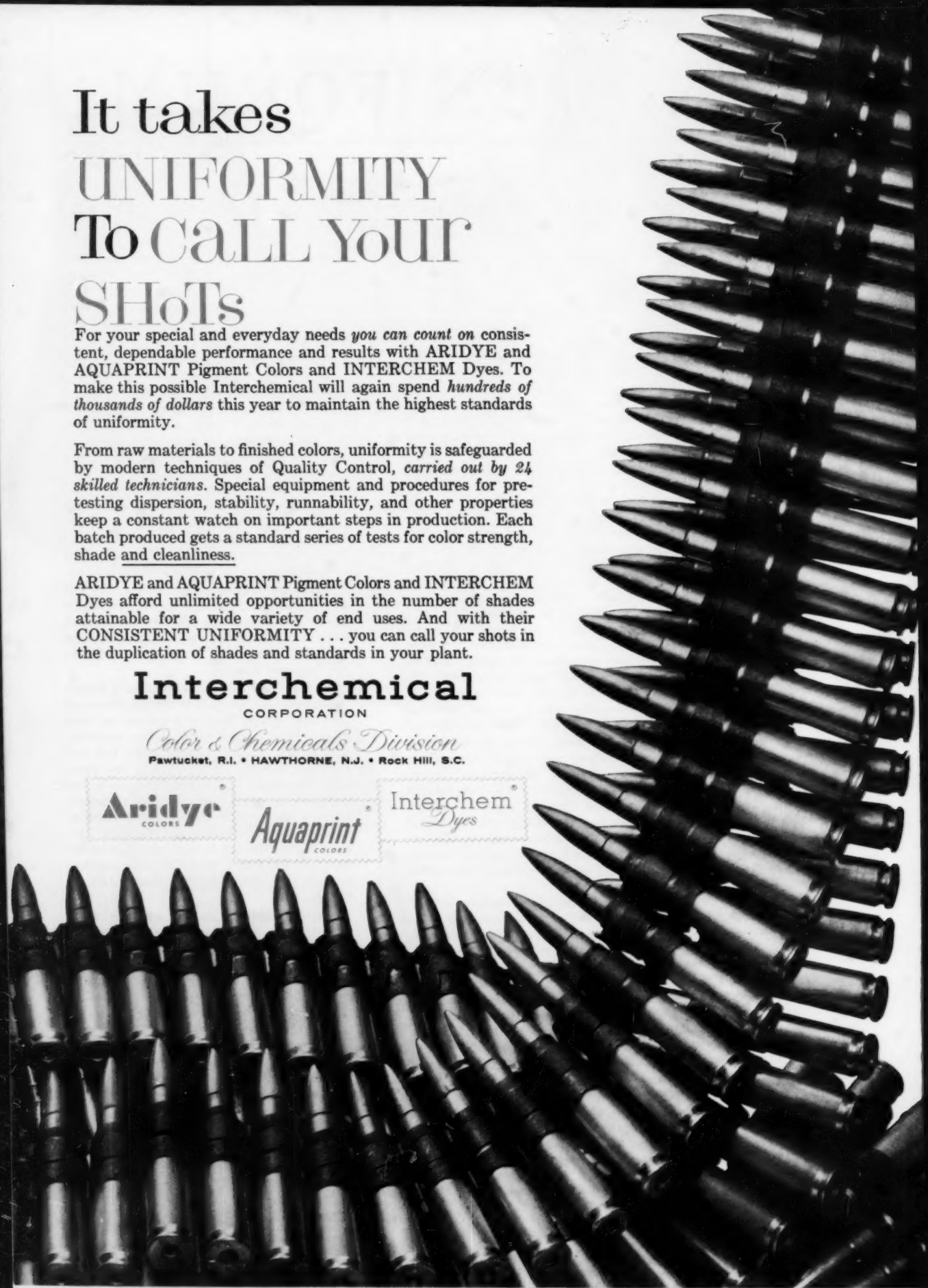

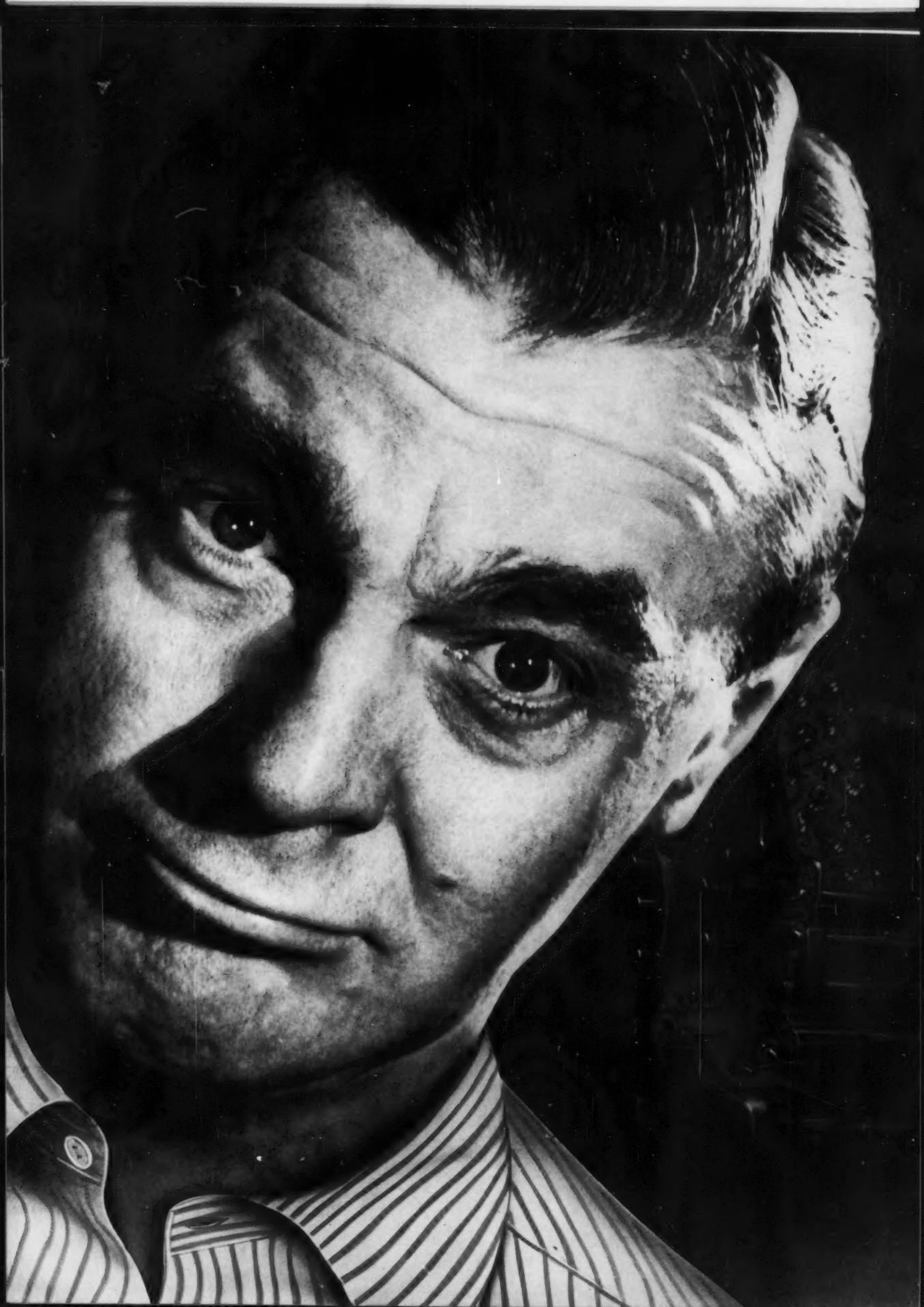

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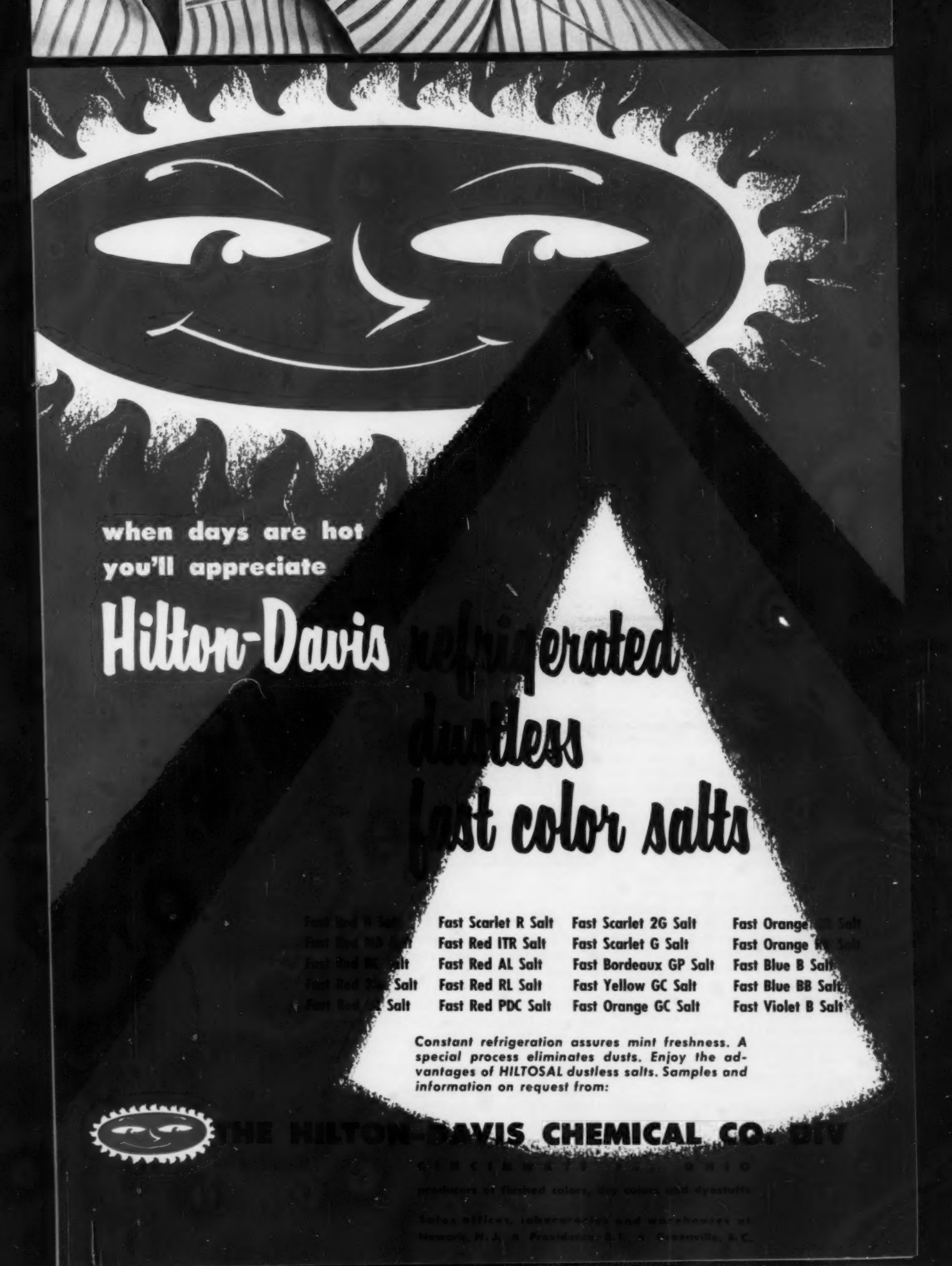
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3. Effective used dry or in brine form. TNA-5 works equally well, whether it's used dry or as brine. However, many dyehouses lately have switched to brine (which is made automatically in the Sterling TNA-5 Dissolver), because they prefer the economies of bulk purchasing and reduced handling of TNA-5.

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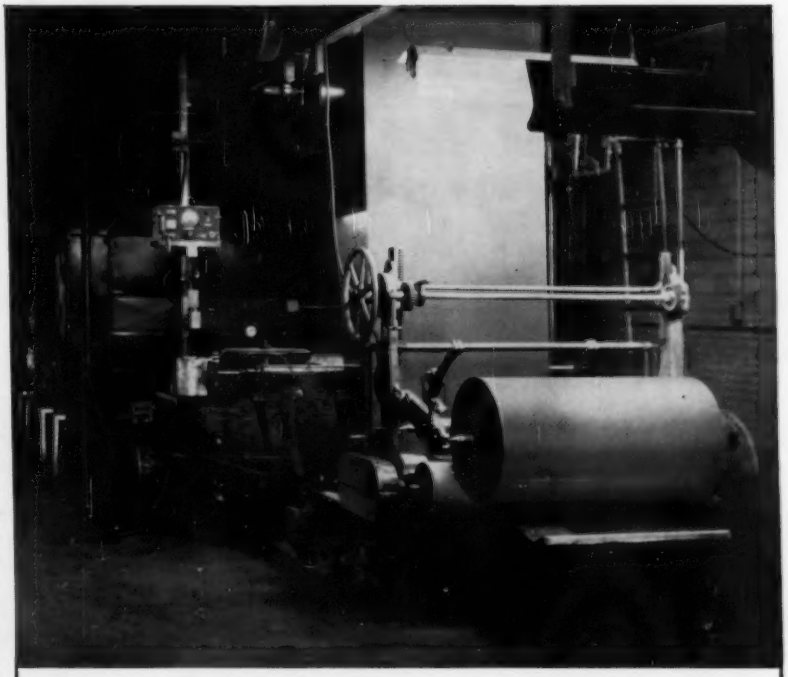

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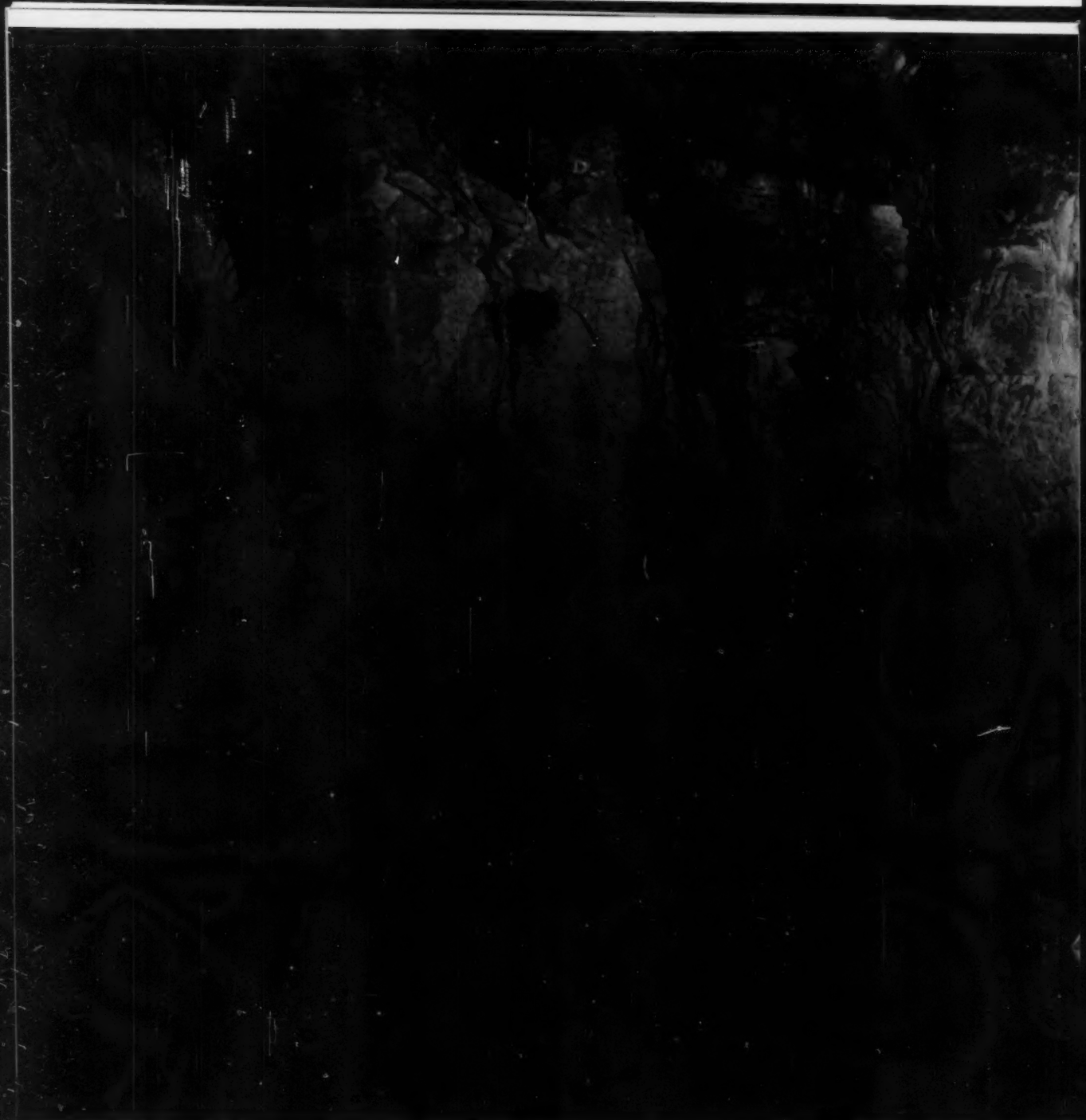

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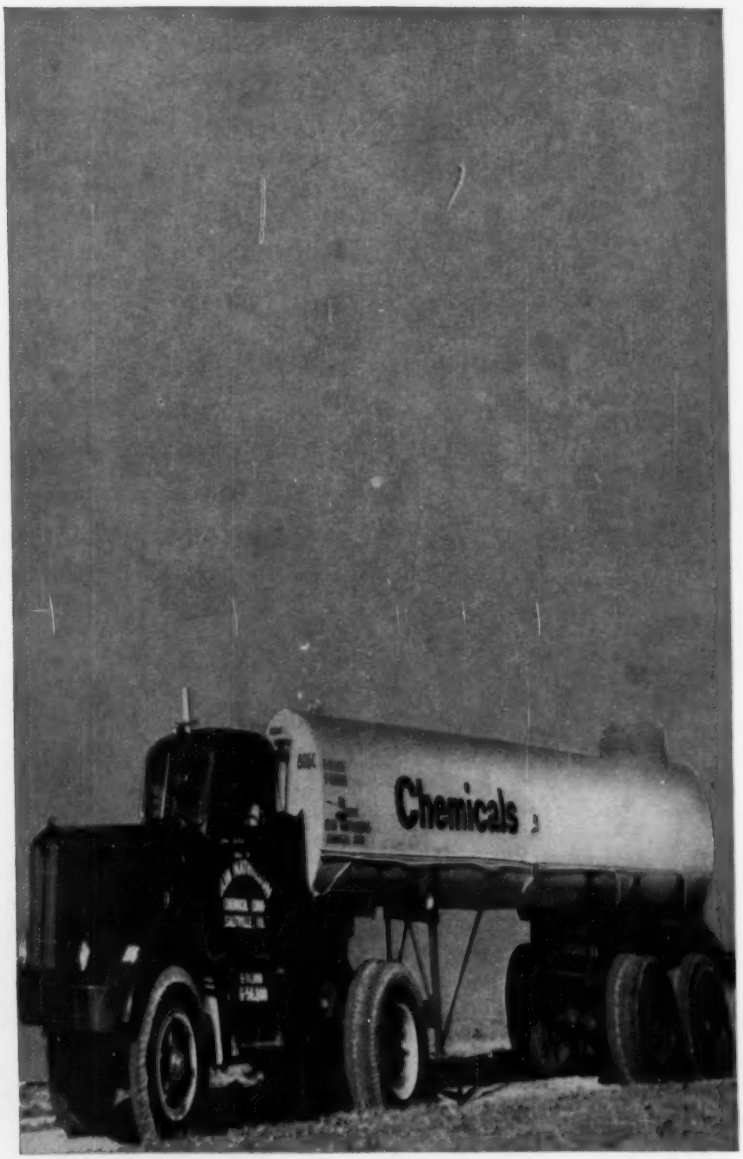

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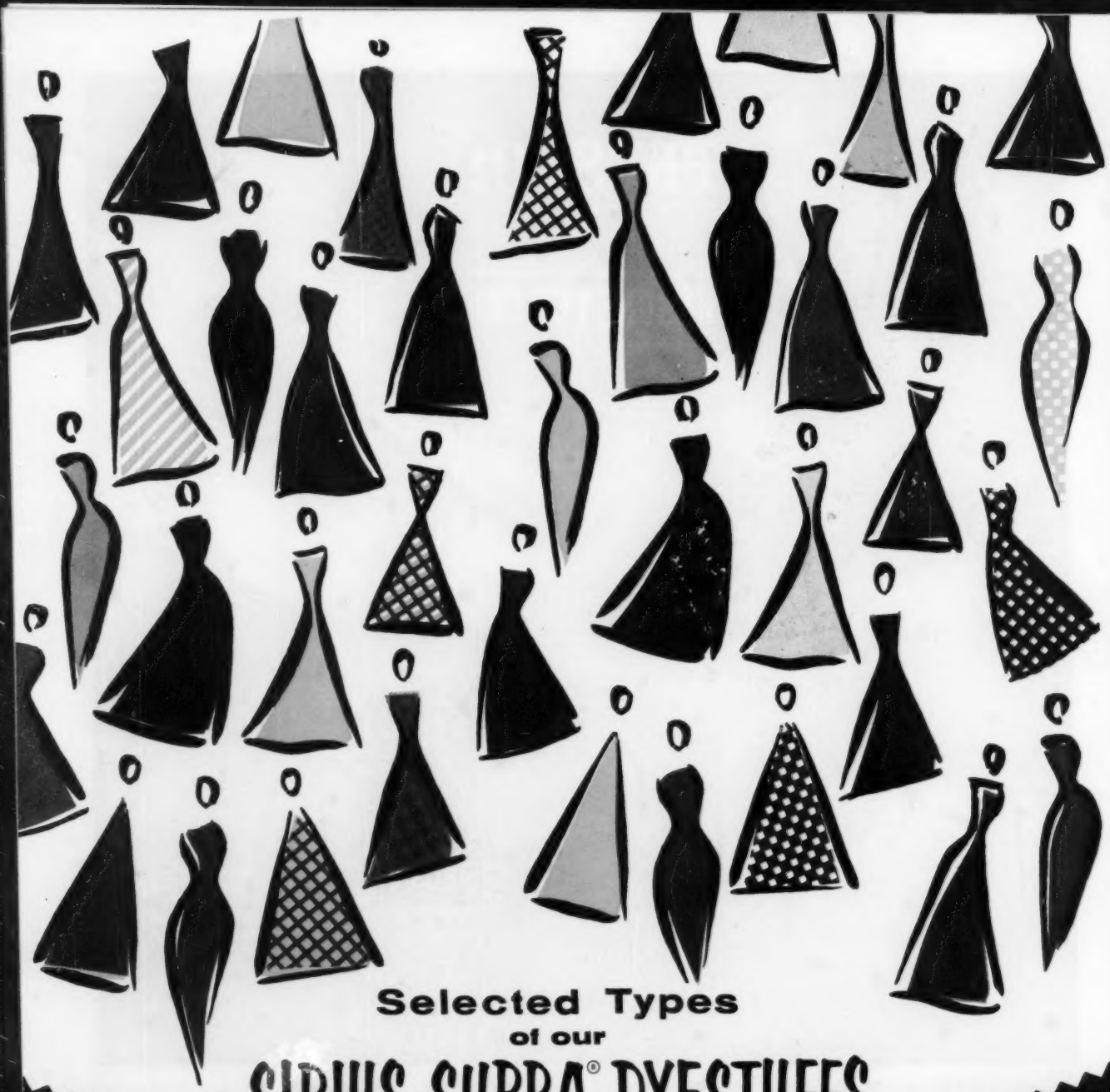

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DYEING UNSCOURED WOOL

LOUIS I FIDELL

Fibers Div
American Cyanamid Co
Bound Brook, N J

(concluded from May 15 issue)

ACID (METALLIZED) DYES——The introduction of metallized dyes, in which the metals were a part of the dye structure, produced more of desirable fastness results, but the necessity of higher percentages of strong acid for their application contributed additional loss of tensile strength, and so detracted from over-all value of these so-called acid (metallized) dyes. In general wool application, they required 6% sulfuric acid owf and boiling for upward of 1.5 hours.

The effects of metal complex acid-dyeing dyes on fiber tensile strength in wool dyeing was reported by Robinet and Michailides (*9*) with conclusions of noticeable loss of tensile strength on one-hour boil and alarming loss on prolonged boiling.

Results of tensile strength tests, in an investigation by the writer, of shrinkproof wool spun into worsted yarn and skein dyed with acid (metallized) dyes, in comparison with level-dyeing acid dyes, show the nature of the losses involved. All were processed at the boil for 90 minutes in a 1-to-25 ratio dyebath (*10*).

The loss of tensile strength can be noted on a percentage basis from the data in Table III as related to two types of dye classes.

The effect of reduction of acid concentration by use of Calcofast Salt Solution is noted by the drop in average loss of tensile strength and the approach to that obtained with level-dyeing acid dyes.

Many other approaches to the dyeing of wool with the objective of economy or lessening damage, or even non-objective approaches have been considered as gleaned from the literature. Some are attempts to dye wool from solvent baths by pressure high-temperature techniques, low temperature, by padding and other short-period procedures. Because of reasons of economy, nonpracticality and noneffectiveness over a broad application, these procedures are not generally used in practice.

TABLE III

	Shrinkproof worsted Loss of tensile strength			
Dyeing Method	*No. lots dyed*	*Min loss (%)*	*Max loss (%)*	*Average (%)*
4% Sulfuric acid No dye	9	13	24	18.50
6% Sulfuric acid No dye	9	18	26	21.55
5% Sulfuric acid Acid metallized dyes	6			18.50
2% Sulfuric acid 2% Calcofast Salt Solution Acid metallized dyes	6			13.80
4% Sulfuric acid 10% Glauber's salt Acid dyes (leveling)	4 each		navy brown bordeaux	14.30 12.12 11.50

NEUTRAL (METALLIZED) DYES——The discovery of dyes of metallo-organic complex operable at pHs close to the neutral point has further reduced the time factor as well as the severity of dyeing conditions previously needed for dyeing many wool items with satisfactory fastness results.

Although at present the number of bright shades is limited as it is with the other classes of metal-containing complexes, the neutral (metallized) dyes offer sufficient in the way of reduced time of operation, less severity of dyeing conditions and good fastness results for consideration in an effort to dye wool with retained grease.

DYEING UNSCOURED WOOL——The dyeing of wool without first removing the suint and dirt we found to be impractical because of interference with color value and because of the fixation of dirt on the fiber at the higher dyeing temperatures.

By treating the fleece wool with hot water to remove the suint and dirt as previously outlined, the objections of poorer color value and dull shades were eliminated.

It has been shown in sections "Effects of Water Temperature on Fleece Wool" and "Grease Content of Treated Wool," that spraying at 140°F leaves wool in satisfactory clean condition with about 8% of wool grease retained.

The use of diammonium phosphate was found to provide pH conditions in the range of 7.50 to 6.50 suitable for the general application of neutral (metallized) dyes, though a number of these dyes are usable at lower pH conditions. As will be noted from the treatment of wool with diammonium phosphate in table of "Grease Content of Treated Wool," the wool grease was not removed by the diammonium phosphate.

The removal of wool grease by the use of a nonionic compound, such as Deceresol NI, provides a short time operation of about five minutes at temperatures of 135°F to 120°F.

The neutral (metallized) dyes have sufficient fastness to withstand a nonionic scour after dyeing.

Based on the above four findings, fleece wool was sprayed at 140°F, dyed with all available neutral (metallized) dyes using diammonium phosphate, and then scoured with Deceresol NI. For comparison purposes each dye was simultaneously dyed on wool from the same lot that had been prescoured by the standard soap and soda ash procedure.

The results are a measure of the fastnesses and properties of wool with approximately 0.50% residual

TABLE IV

Fastness properties comparison

1 — Soap and Soda Prescour, Neutralized
2 — Sprayed at 140°F

Dye Name or Colour Index Identity		Dyebath pH	Dyebath Exhaust	Fade-Ometer rating (lightfastness)	Wool Wash No. 3 AATCC Fiber staining† Hue	Str	W	V	S	C	Ac	N	Other synth
CI Acid Yellow 114	1	6.25	Fair	7	5	4–5	4–5	–	4–5	–	–	4–5	–
	2	6.40	Fair	7	5	4–5	4–5	–	4–5	–	–	4–5	–
Supralan Yellow NR-CF	1	7.10	Fair	7–8	4R	4	4	–	2	–	4–5	3	–
	2	7.30	Fair	7–8	4R	4	4	–	2	–	4–5	3	–
Capracyl Yellow NW	1	7.05	Fair	7–8	5	5	3	–	2	–	–	2	Or 4-5
	2	7.30	Fair	7–8	5	5	3	–	2	–	–	2	Or 4-5
Calcofast Neutral Yellow G	1	7.00	Poor	7–8	5	3–4	3	–	2	–	–	2	–
	2	7.40	Poor	7–8	5	3–4	3	–	2	–	–	2	–
Cibalan Yellow 2BRL	1	7.25	Fair	7–8	5	5	4	–	3	–	–	3	–
	2	7.35	Fair	7–8	5	5	4	–	3	–	–	3	–
Supralan Brown NV-CF	1	6.15	Fair	7–8	5	5	3	–	2	–	–	2	An 3–4
	2	6.55	Fair	7–8	5	4–5	3	–	2	–	–	2	An 3
Calcofast Neutral Orange 2G	1	7.20	Fair	7–8	5	3–4	4	–	3	–	–	2	An 3
	2	7.50	Fair	7–8	5	3–4	4	–	3	–	–	2	An 3
CI Acid Brown 31	1	7.30	Fair	7–8	5	3–4	4	–	3	–	–	2	An 3–4
	2	7.40	Fair	7–8	5	3–4	4	–	3	–	–	2	An 3–4
CI Acid Orange 82	1	6.75	Fair	6–7	5	4–5	4–5	–	3–4	–	–	3	–
	2	7.00	Fair	7	5	4–5	4–5	–	3–4	–	–	3	An 4–5
CI Acid Orange 86	1	7.00	Fair	7	5	5	–	–	4	–	–	4	An 4–5
	2	7.30	Fair	7	5	4	–	–	4	–	–	4	An 4–5
CI Acid Red 209	1	6.25	Fair	4–5	5	5	4–5	–	3–4	–	–	3	An 4–5
	2	6.40	Fair	4–5	5	4–5	4–5	–	3–4	–	–	3	An 4–5
CI Acid Red 220	1	7.00	Good	4–5	5	5	4–5	–	4	–	–	4	An 4
	2	7.30	Good	4–5	5	4	4	–	3–4	–	–	3–4	An 4
Irganol Red BLS	1	6.60	Fair	6	5	5	4	–	3	4–5	–	3	–
	2	7.00	Fair	6	5	5	4	–	3	4–5	–	3	–
CI Acid Red 182	1	7.00	Fair	7	5	4–5	3	–	2–3	–	–	2	An 4
	2	7.40	Fair	7	5	4–5	3	–	2–3	–	–	2	An 4
CI Acid Red 218	1	6.80	Fair	7	5	4–5	4–5	–	3–4	–	–	2–3	An 3–4
	2	6.75	Fair	7	5	4	4–5	–	3–4	–	–	2–3	An 3–4
CI Acid Red 182	1	8.20	Fair	7	5	4–5	3	–	3	–	–	2	An 4–5
	2	7.30	Fair	7	5	4–5	3	–	3	–	–	2	An 4–5
CI Acid Red 182	1	6.25	Fair	7–8	5	4	3	–	3	–	–	2	An 4
	2	6.50	Fair	7–8	5	4	3	–	3	–	–	2	An 4
CI Acid Violet 71	1	6.55	Fair	7	5	4–5	–	–	4–5	–	–	3	An 4
	2	6.90	Fair	7–8	5	4–5	–	–	4–5	–	–	3	An 4
CI Acid Violet 70	1	6.65	Fair	7	5	5	4–5	–	4	–	–	2–3	An 4–5
	2	7.00	Fair	7–8	5	5	4–5	–	4	–	–	2–3	An 4–5
CI Acid Violet 78	1	6.70	Fair	5–6	5	4–5	4	–	3–4	–	–	3	–
	2	6.80	Fair	5–6	5	4	4	–	3–4	–	–	3	–
CI Acid Blue 168	1	6.50	Fair	6–7	5	5	–	–	4	–		3	–
	2	7.00	Fair	6–7	5	4–5	4	–	4	–		3	–
Lanasyn Blue GL	1	6.50	Fair	5–6	5	5	3–4	–	3–4	–	4–5	3–4	–
	2	7.00	Fair	5–6	5	5	3–4	–	3–4	–	4–5	3–4	–
Irganol Green BLS	1	7.25	Fair	5	5	5	–	–	4	–	–	–	–
	2	7.30	Fair	5	5	5	–	–	4	–	–	–	–
Irganol Green 4GLS	1	6.60	Fair	6–7	5	4–5	4–5	–	–	4	–	3	–
	2	7.00	Fair	7	5	4–5	4–5	–	–	4	–	3	–
CI Acid Brown 45	1	7.00	Good	6–7	5	5	4–5	–	3–4	–	–	4	–
	2	7.30	Good	7	5	5	4–5	–	4	–	–	4–5	–
CI Acid Brown 44	1	6.60	Fair	6–7	5	5	4–5	–	3–4	–	–	4	An 4–5
	2	6.90	Fair	5–6	5	4–5	4–5	–	3–4	–	–	4	An 4–5
CI Acid Brown 19	1	6.50	Fair	7	5	4–5	4–5	–	4–5	–	–	4–5	–
	2	6.90	Fair	7	5	4–5	4–5	–	4–5	–	–	4–5	–
CI Acid Brown 46	1	6.80	Fair	6	5	4	–	–	4	–	–	4–5	–
	2	7.00	Fair	6	5	4	–	–	4	–	–	4–5	–
CI Acid Brown 28	1	7.35	Fair	7	5	5	4–5	–	3	–	–	4	An 4–5
	2	7.50	Fair	7	5	5	4–5	–	3	–	–	4	An 4–5
CI Acid Brown 21	1	6.40	Fair	7–8	5	4–5	–	–	4	–	–	4	–
	2	7.00	Fair	7–8	5	4–5	–	–	4	–	–	4	–
Cibalan Khaki GL	1	7.30	Fair	7–8	5	5	–	–	–	–	–	–	–
	2	7.30	Fair	7–8	5	4–5	–	–	4	–	–	4	–
Capracyl Black N	1	6.50	Fair	5–6	5	4–5	3 Bl	–	2 Gy	–	–	1 Gy	–
	2	7.00	Fair	5–6	5	4–5	3 Bl	–	2 Gy	–	–	1 Gy	–
Lanasyn Olive BGL	1	7.30	Fair	6	4	4–5	4	–	3–4	–	–	4	–
	2	7.40	Fair	6	4–5	4–5	–	–	3–4	–		4	–
CI Acid Black 60	1	7.00	Fair	6–7	5	4–5	–	–	4	–	–	4	–
	2	7.50	Fair	6–7	5	4–5	–	–	4	–	–	4	–
CI Acid Orange 85	1	6.80	Fair	7–8	5	4	4–5	–	3	–	–	3	–
	2	7.00	Fair	7–8	5	4–5	4–5	–	3	–	–	3	–
CI Acid Orange 60	1	7.20	Poor	6–7	5	4	4	–	3–4	–	–	3	–
	2	7.40	Poor	6–7	5	4	3–4	–	3	–	–	2–3	–

† R-redder; Bl-bluer; Y-yellower; Gy-grayer

Neutral (metallized) dyes

Tests on Stock Before Fulling: — Wash — Crocking
Tests on Felted Pads (Neutralized) After Fulling: — Light—Perspiration

Acid perspiration Fiber staining									*Alkaline perspiration Fiber staining*									*Crocking*		*Fiber* selectivity*		
Hue	*Str*	*W*	*V*	*S*	*C*	*Ac*	*N*	*Other synth*	*Hue*	*Str*	*W*	*V*	*S*	*C*	*Ac*	*N*	*Other synth*	*Dry*	*Wet*	*Body*	*Tips*	*Remarks*
5	5	–	–	–	–	–	–	–	5	–	–	–	–	–	–	–	–	4–5	4–5	2	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	3	3	
		–	–	3	–	4	–	–			3	3	2–3	3	3	3	–	5	4–5	1–2	1–2	
		–	–	3	–	4	–	–			3	3	2–3	3	3	3	–	5	4–5	2	–2	
5	5	–	–	–	–	–	–	–			4	–	3	–	–	4	–	4–5	4–5	2	–2	
5	5	–	–	–	–	–	–	–			–	–	4	–	–	4–5	–	4	4–5	3	–2	
		–	–	4–5	–	–	4–5	–			–	–	4	–	–	4	–	5	4–5	1–2	–1	
		–	–	4–5	–	–	4–5	–			–	–	3	–	–	4	–	4–5	4–5	3	–2	
5	5	–	–		–	–	–	–	5	5	–	–	–	–	–	–	–	4	4–5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	3	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	4–5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	4–5	3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	1–2	–1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	1–2	–1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	2–3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	4–5	2–3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	2	–2	Tips lighten on washing
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	4	2–3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	5	2–3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	4	2–3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	3	2–3	3	
5	5	–	–	–	–	–	–	–	5	5		–	–	–	–	–	–	4–5	4–5	1–2	2–3	
5	5	–	–	–	–	–	–	–	5	5		–	–	–	–	–	–	4	5	1–2	2–3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	2	–1–2	Tips lighten on washing
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	3	–1–2	Tips lighten on washing
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	2–3	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2–3	3	
5	5	–	–	–	–	–	–	–			4–5	4–5	–	4–5	–	–	–	4–5	4–5	2	–1–2	
5	5	–	–	–	–	–	–	–			4–5	4–5	–	4–5	–	–	–	5	5	2	–1–2	
5	5	–	–	–	–	–	–	–			4–5	4–5	–	4–5	–	–	–	4–5	5	3	–1	
5	5	–	–	–	–	–	–	–			4–5	4–5	–	4–5	–	–	–	5	5	3	–1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	5	3	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	3	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	3	–2–3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	3	–2–3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4	2	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4	2–3	3	
5	5	–	–	–	–	–	–	–	4–5	4–5	–	–	–	–	–	–	–	5	4–5	2	–1	
5	5	–	–	–	–	–	–	–	4–5	4–5	–	–	–	–	–	–	–	5	4–5	2	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	1–2	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	1–2	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	1–2	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	3–4	1–2	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	2	2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2–3	–1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	5	2	2 Yell	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	5	1–2	2 Yell	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–1 Yell	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	5	2	–1–2 Yell	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2–3	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	2–3	–1	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	2	–1 Yell	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	4–5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	2	–2–3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	1–2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	1–2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2	1–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	5	2–3	–2	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	5	2	–2–3	
5	5	–	–	–	–	–	–	–			–	–	4	–	–	3	–	4–5	4–5	3	–1–2	Tips lighten on washing
5	5	–	–	–	–	–	–	–			–	–	4	–	–	4	–	4	5	3	–2	Tips lighten on washing

*1 Very Tippy 3 Not Tippy 1 Very Selective 3 Not Selective – Lighter Tips

TABLE V

Fastness properties comparison

1 — Soap and Soda Prescour — Neutralized
2 — Sprayed at 140°F

Dye Name or Colour Index Identity		Dyebath pH	Dyebath Exhaust	Fade-Ometer rating (lightfastness)	Wool Wash Test No 1 Fiber staining Hue	Str	W	V	S	C	Ac	N	Other synth
CI Acid Orange 54	1	6.55	Fair	4–5	5	5	–	–	3–4	4–5	–	–	–
	2	6.85	Fair	4–5	5	5	–	–	3–4	4–5	–	–	–
CI Acid Red 89	1	6.45	F-G	3–4	5	4	–	–	4–5	–	–	–	–
	2	6.70	F-G	3–4	5	4	–	–	4–5	–	–	–	–
CI Acid Red 97	1	6.55	F-G	4–5	5	5	–	–	4–5	–	–	–	–
	2	6.80	F-G	4–5	5	5	–	–	4–5	–	–	–	–
CI Acid Red 99	1	6.60	F-G	5	5	5	–	3–4	–	3	–	4–5	
	2	6.75	F-G	5	5	4	–	3	1–2	1–2	4–5	4	–
CI Acid Red 151	1	6.50	F-G	5–6	5	4	–	4	1	2–3	4–5	2–3	–
	2	6.70	F-G	5–6	5	4	–	4	1	2–3	4–5	2–3	–
CI Acid Red 167	1	6.75	Fair	4	5	5	–	4	3	3	4–5	–	–
	2	6.90	Fair	4	5	4	–	3	2–3	3	–	3–4	–
CI Acid Red 134	1	6.60	Fair	3–4	5	5	–	–	3–4	4	–	4	–
	2	6.90	Fair	4	5	4–5	–	–	3–4	4	–	4	–
CI Acid Violet 9	1	6.50	Fair	3	5	4	–	–	4–5	4–5	–	–	–
	2	6.70	Fair	3	5	3	–	–	3–4	4–5	–	–	–
CI Acid Violet 17	1	6.00	Poor	2–3	5	4–5	–	–	3	–	–	4–5	–
	2	6.30	Poor	2–3	5	4	–	–	2	–	–	4–5	–
CI Acid Blue 102	1	—	Fair	3	5	4–5	3	–	–	–	–	3	–
	2	6.80	Fair	3–4	5	4	3	–	2	–	–	3	–
CI Acid Blue 78	1	6.60	F-P	5–6	5	4	–	–	1–2	–	–	3–4	–
	2	6.70	F-P	5–6	5	4–5	–	–	2	–	–	3	–
CI Acid Blue 7	1	6.60	Poor	1–2	5	4	3	–	2	–	–	3	–
	2	6.70	Poor	1–2	5	4	4	–	3	–	–	–	–
CI Acid Blue 120	1	6.65	Fair	6	5	3–4	–	4–5	3–4	3–4	–	3–4	–
	2	6.80	Fair	6	5	4	–	4–5	3	3	–	3	–
CI Acid Green 16	1	6.65	Poor	1	5	4	–	–	2	–	–	–	–
	2	6.70	Poor	1	5	4	–	–	2	–	–	–	–
CI Acid Green 9	1	6.60	Poor	1–2	5	4	–	–	–	–	–	–	–
	2	6.70	Poor	2	5	4	–	–	–	–	–	–	–
CI Acid Green 25	1	6.50	Poor	5–6	5	4	–	–	–	–	–	–	–
	2	6.60	Poor	–	5	4	–	–	–	–	–	–	–
CI Acid Green 25	1	6.40	F-G	6	5	3–4			3–4			4	–
	2	6.80	F-G	6	5	3–4			3–4			4	–
CI Acid Black 26	1	6.75	Fair	5–6	5	4	4	4	3	3	–	–	–
	2	6.75	Fair	5	5	4	4	4	3	3	–	–	–
CI Acid Black 48	1	5.90	Fair	7–8	5	3–4	–	–	4–5	4–5	3	4	–
	2	6.50	Fair	7–8	5	4	–	–	4	4–5	3–4 R	4	–

grease compared with wool containing approximately 6% to 8% grease during dyeing.

Examination showed the comparison of the fastness tests of the neutral (metallized) dyes applied to grease-retained wool to be not practically different than when applied to prescoured wool. The work was then extended to acid and direct dyes including some Calcocid acid milling dyes and those Calcomine direct dyes suitable for wool cellulosic unions. Tables IV, V, and VI give in detail the conditions and fastness results for 48 neutral (metallized) dyes, 19 neutral-dyeing acid dyes, and 18 neutral-dyeing direct dyes.

These were applied as follows:

1½% diammonium phosphate.
30 to 1 volume.
2% Dye (based on clean wool weight)
100°F to boil in 15 minutes.
Boil 45 minutes.

Prescoured wool dyeings were rinsed and air dried. "Sprayed-only" wool dyeings were scoured without previous rinsing. The bath was drained, water added to 20/1 volume and temperature raised to 135°F.

2% Deceresol NI Conc Wetting Agent and 3% sodium *meta*-bisulfite were added (owf).

The wool was worked lightly for five minutes, the bath was drained, and the wool extracted without rinsing and then dried.

The elimination of rinsing in the scoured-after-dyeing procedure was intended to get as severe a condition as possible, to simulate a practical situation where all the dye was not rinsed out prior to *afterscouring* and where all the Deceresol NI Conc Wetting Agent was not removed after the afterscouring was completed.

The addition of a nonionic compound to the dyebath, even at the last stages of dyeing, has in most cases little or no effect on producing results of maximum freedom from crocking.

Economically, it is cheaper to drop the dyebath and refill to the scouring temperature of 135°F rather than cool the dyebath from the boil to optimum scouring temperature. For this reason, the procedure of a separate scouring bath, after dyeing, was used.

The theory of the action of nonionic compounds in dyebaths has been discussed by Luck (*11*). He considers a dye nonionic complexing. The complex, if occluded in the fiber at high temperature, would account for no improvement in crocking and for some-

Neutral-dyeing acid dyes

Tests on Raw Stock Before Fulling: — Wash No. 3 — Crocking
Tests on Felted Pads, Neutralized After Fulling: — Light — Perspiration

Acid perspiration Fiber staining									*Alkaline perspiration Fiber staining*									*Crocking*		*Fiber* selectivity*			
Hue	*Str*	*W*	*V*	*S*	*C*	*Ac*	*N*	*Other synth*	*Hue*	*Str*	*W*	*V*	*S*	*C*	*Ac*	*N*	*Other synth*	*Dry*	*Wet*	*Body*	*Tips*	*Bleed in fulling*	*Remarks*
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	4	1–2	2–3	Practically none	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3	4–5	2	2–3	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	4	1–2	2–3	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3	4–5	2	–1–2	"	
5	5	–	–	–	–	–	–	–			–	–	4	–	–	–	–	4	4	1–2	–2	None	
5	5	–	–	–	–	–	–	–			–	–	4	–	–	–	–	4–5	4	2–3	–1–2	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3	3	2	–2	Bleeds	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	3	2–3	3	"	
		–	4	3	4	–	4	–			4	3	3	3	4	3	–	3	5	3	–1	"	
		–	4	4	4	–	4	–			4	3	3	3	3	3	–	5	4–5	3	–1	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	4	2–3	3	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3	4–5	3	3	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4	3	2	3	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3	4 5	2–3	3	"	
		3	4	2	4	–	–	–			3	3	1	3	–	4	–	4	4	1–2	–2	"	
		3	4	2	4	–	–	–			3	3	1	3	–	4	–	4	4	2–3	2–3	"	
		–	4–5	3–4	4–5	–	4–5	–			4	4	3	4	–	4	4	4	5	1–2	3	"	
		–	4–5	3–4	4–5	–	4–5	–			4	4	3	4	–	4	4	4–5	5	1–2	3	"	
4–5	4–5	–	–	–	–	–	–	–	4–5	4–5	–	–	–	–	–	–	–	5	5	1–2	–1	None	
4–5	4–5	–	–	–	–	–	–	–			–	–	4	4	–	4	–	4	5	2	–2	"	
		3	4	3	4	–	3	–			3	3	1	3	4	2	–	5	5	2	–1	"	
		4	–	3	–	–	3	–			3	3	1	3	4	2	–	5	5	2–3	–1	"	
		3	3	2	4	–	4	–			2	–	1	3	–	3	–	4	4	1–2	–1–2	Bleeds	
		4	3	2	4	–	4				2	–	1	3	–	3	–	3	5	2	3	"	
		–	–	3	–	–	3	–			3	3	2	3	3	2	–	4–5	5	2–3	–2	Practically none	
		–	–	3	–	–	3	–			3	3	2	3	3	2	–	3–4	5	3	3	"	
		4	–	2–3	–	–	–	–			3	–	2	–	–	–	–	5	5	1	2–3	"	
		4	–	4	–	–	–	–			4	–	3	–	–	–	–	5	5	1	2–3	"	Weaker
		3	–	2	4	–	4	–			3	–	2	4	–	–		4	3–4	1–2	3	"	
		3	–	2	4	–	4	–			3	–	2	4	–	–	–	4	4–5	1–2	3	Bleeds	
		4	4	4	4	–	4	–			4	4	2	4	–	4	–	5	4	1	–1–2	"	
		–	–	4	–	–	4–5	–			4	4	3	4	–	4	–	4–5	5	1	2–3	"	V poor color value
		4	–	4	–	–	4	–			3	4	2–3	4	–	4	–	4–5	4–5	2	–1–2	Bleeds	
		4	–	4	4	–	4	–			3–4	4–5	3	4–5	–	4–5	–	4	5	3	–1–2	"	
5	5	–	–	–	–	–	–	–			–	4	4	4	–	4	–	4–5	5	2–3	–2	Practically none	
		–	–	4–5	4–5	–	4–5	–			–	4	4	4	–	4	–	3	5	3	3	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	4–5	1–2	–1	"	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	5	5	2–3	–1	"	

*1 Very fiber selective 3 Not selective –1 Very light tips 3 No light tips

times incurred stripping action or loss of color value with nonionics in some dyebaths.

After the prescoured dyeings were rinsed and the afterscoured dyeings extracted, all were checked for acid and alkaline perspiration, crocking, fulling, light and No. 3 AATCC Wool Wash Test for the neutral (metallized) dyes and No. 1 AATCC Wash Test for the acid and direct dyes.

The tests and ratings of fastness are based on American Association of Textile Chemists and Colorists test methods. The evaluation of fiber selectivity and tippiness is on an arbitrary scale of No. 1—No. 2—No. 3. Number 1 designates marked light tips, Number 2 lighter tips than body depth of color, and Number 3 no tippiness. For fiber selectivity, No. 3 indicates good fiber uniformity and No. 1 definite variability.

Absence of a numerical rating indicates no staining of the fiber under the letter designation, given in the order of their appearance in the test cloth, as follows:

W—Wool	N—Nylon
V—Viscose	An—Acrilan
S—Silk	Da—Dacron
C—Cotton	Dy—Dynel
Ac—Acetate	Or—Orlon

COMPARISON OF FASTNESS TABLES—NEUTRAL (METALLIZED), MILLING AND DIRECT DYES———These comparisons can be divided into two categories, fastness properties and nonfastness properties. With regard to fastness properties, it is evident from Tables IV-VI that afterscoured dyeings are generally as fast all-round and in some cases better than the prescoured dyeings. A comparison of the properties of individual dyes on prescoured and unscoured or sprayed-only wool, is best taken directly from the tabulations themselves.

Because of its importance as a criterion for determining suitability of finished dyed items where all other qualifications such as lightfastness, washfastness and other wet properties are adequate, and because failure to meet this specification has previously severely limited attempts to dye unscoured wool, crocking is considered in some detail.

CROCKING———The data of crocking in the tabulation are considered here as a comparison of results by the two procedures of dyeing, scoured wool versus unscoured wool, bearing in mind that afterscoured dyeings were not rinsed as a final step, and prescoured were.

TABLE VI
Fastness properties comparison

1 — Soap-Soda Prescoured Wool
2 — Sprayed at 140°F

Dye Name Colour Index Identity		Dyebath pH	Dyebath Exhaust	Fade-Ometer rating (lightfastness)	Wool Wash No 1 AATCC Fiber staining Hue	Str	W	V	S	C	Ac	N	Other synth
CI Direct Yellow 12	1	6.20	Good	6–7	4	4	–	1–2	4–5	1	–	–	–
	2	6.40	Good	6–7	5	4	–	1	4	1	–	–	–
CI Direct Yellow 26	1	6.25	Good	5	5	4	–	1	4–5	1	–	–	–
	2	6.30	Good	5	5	4	–	1	4–5	1	–	–	–
CI Direct Orange 1	1	6.10	Good	6	5	4–5	–	2–3	–	2–3	–	–	–
	2	6.30	Good	6	5	4–5	–	2	–	2	–	–	–
CI Direct Brown 1	1	5.90	Good	3–4	5	3–4	–	1–2	4	1–2	–	4	–
	2	6.20	Good	3–4	5	3–4	–	1	3	1–2	–	4	–
CI Direct Brown 49	1	5.85	Fair	4–5	5	4–5	–	3–4	–	3–4	–	–	–
	2	6.15	Fair	4–5	5	4	–	3–4	–	3–4	–	–	–
CI Direct Brown 2	1		Good	5	5	4	–	1–2	4–5	1–2	–	4–5	–
	2		Good	5	5	5	–	1–2	4–5	1–2	–	4–5	–
CI Direct Brown 31	1	6.70	Fair	3–4	5	4–5	–	3	–	3	–	4–5	–
	2	6.80	Fair	4	5	5	–	3	–	3	–	4–5	–
CI Direct Brown 74	1	5.85	Fair	4	5	5	–	2–3	–	2–3	–	4–5	–
	2	6.15	Fair	4	5	4	–	2–3	–	2–3	–	4–5	–
CI Direct Red 10	1	5.85	Fair	4–5	5	4–5	–	1	4–5	1	–	4	–
	2	6.40	Fair	4–5	5	5	–	1	4–5	1	–	4	–
CI Direct Red 81	1	5.80	Fair	5–6	5	4–5	–	1	3	1	–	–	
	2	6.20	Fair	5–6	5	4–5	–	1	3	1	–	–	–
CI Direct Red 2	1	5.90	Fair	5–6	5	5	–	1–2	4	2–3	–	3	–
	2	6.30	Fair	5	5	5	–	1	4	1–2	–	3	–
CI Direct Red 37	1	5.80	Fair	5	5	4–5	–	2–3	3–4	2–3	–	4–5	–
	2	6.20	Fair	5	5	4–5	–	2–3	3–4	2–3	–	4–5	–
CI Direct Red 39	1	5.90	Fair	6	5	4–5	–	1–2	3	1–2	–	–	–
	2	6.30	Fair	6	5	4–5	–	1–2	3	1–2	–	–	–
CI Direct Blue 22	1	6.40	Fair	3	5	4–5	–	2	–	2	–	3–4	–
	2	6.70	Fair	3	5	4–5	–	2	–	2		3–4	–
CI Direct Green 1	1	5.95	Fair	5	5	5	–	3–4	–	3	–	4 Y	
	2	6.25	Fair	5–6	5	5	–	3	–	3	–	4 Y	–
CI Direct Green 6	1	6.40	Fair	4	5	4	–	3	–	3	–	3 Y	–
	2	6.80	Fair	4	5	4	–	2–3	–	2–3	–	2 Y	–
CI Direct Black 51	1	6.50	Fair	4–5	5	4	–	2	–	2	–	–	–
	2	6.80	Fair	4–5	5	4	–	2	–	2	–	–	–
CI Direct Black 38	1	6.50	Fair	5	5	4–5	–	1–2	4	1–2	–	4	–
	2	6.80	Fair	5	5	4–5	–	1–2	4	1–2	–	4	–

The ratings by the AATCC wet and dry crocking tests on the two wools vary. Some are better on the unscoured wool, others are unchanged, a few are lowered.

In the crockfastness comparison in Table VII the numbers following the items "dry crocking" and "wet crocking," are the number of dyeings rated under the qualifying number from 5 to 1, the 5 rating being no color transfer.

These total to the number of dyes in the three tabulations.

As will be noted from Table VII, the *wet* crocking ratings for unscoured dyeings are better for a greater number of dyes. The *dry* crocking ratings show a little better for the prescoured wool.

The specific differences in dry crocking are shown in Table VIII for a number of neutral (metallized)

TABLE VII
Crockfastness comparison

	Scoured wool						Unscoured wool					
AATCC Ratings	*5*	*4-5*	*4*	*3-4*	*3*	*<3*	*5*	*4-5*	*4*	*3-4*	*3*	*<3*
Neutral (metallized) dyes												
Dry crocking	17	14	5	2	0	0	17	7	12	2	0	0
Wet crocking	14	20	4	0	0	0	21	14	1	2	0	0
Neutral acid dyes												
Dry crocking	5	3	9	0	2	0	4	3	4	2	6	0
Wet crocking	7	2	7	1	2	0	10	7	1	0	1	0
Direct dyes												
Dry crocking	3	5	3	1	5	1	0	3	5	4	5	1
Wet crocking	0	2	2	10	2	2	3	3	2	7	1	2

TABLE VIII
Dry crocking comparison of scouring procedures
Neutral (metallized) dyes

	Dry crock: Soap and soda ash prescour	Dry crock: Sprayed unscoured	Dry crock: Deceresol NI Conc Wetting Agent After dyeing	Dry crock: Deceresol NI Conc Wetting Agent Before dyeing
CI Acid Yellow 114	4-5	5	5	
Supralan Yellow NR	5	4-5	5	
Capracyl Yellow NW	4-5	4	5	
Calcofast Neutral Yellow G	5	4-5	5	5
Cibalan Yellow 2BRL	4	5	5	
Irgalan Yellow 2RL	4-5	4	5	
Supralan Brown NY-CF	5	4	5	
Calcofast Neutral Orange 2G	4-5	4	4-5	
CI Acid Brown 31	4-5	5	5	5
CI Acid Orange 82	4-5	4	4-5	
CI Acid Orange 86	4-5	4	4-5	
CI Acid Red 209	3-4	4	4-5	
CI Acid Red 220	3-4	4-5	4	
Irganol Red BLS	4-5	4	4-5	
CI Acid Red 218	4-5	5	4-5	
CI Acid Red 182	4-5	5	4-5	4-5
CI Acid Violet 71	4-5	5	4-5	
CI Acid Violet 70	5	4-5	5	
CI Acid Violet 78	5	5	5	
CI Acid Blue 168	4-5	5	4-5	4-5
Lanasyn Blue GL	5	5	5	
Irganol Green BLS	5	5	5	
Irganol Green 4GLS	4-5	3-4	4-5	
CI Acid Brown 45	5	4-5	5	
CI Acid Brown 44	4-5	4	4-5	4
CI Acid Brown 19	5	5	5	
CI Acid Brown 46	5	4	5	
CI Acid Brown 28	5	4-5	5	
CI Acid Brown 21	5	4-5	5	
Cibalan Khaki GL	5	5	5	
Capracyl Black N	5	5	5	
Lanasyn Olive BGL	5	5	5	
CI Acid Black 60	5	5	5	
CI Acid Orange 60	4-5	4	4-5	

———Direct dyes

Tests on Stock Before Fulling: — Wash — Crocking
Tests on Felted Pads (Neutralized): — Light — Perspiration

		Acid perspiration Fiber staining							*Alkaline perspiration Fiber staining*								*Crocking*		*Fiber* selectivity*		*Bleed in Fulling*
Hue	*Str*	*W*	*V*	*S*	*C*	*Ac*	*N*	*Other synth*	*Hue*	*Str*	*W*	*V*	*S*	*C*	*Ac*	*N*	*Other synth*	*Dry*	*Wet*	*Body*	*Tips*	
		–	4	4	3	–	4	–			4	1	2	1	–	3	–	4–5	3–4	1–2	2–3	Bleeds
		–	3	3	2	–	3	–			4	1	2	1	–	3	–	3–4	4–5	1–2	2–3	"
		4	4	3	4	4	3	–			4	3	3	3	4	3	–	5	4–5	2	–2	"
		4	4	3	4	–	3	–			4	3	3	3	4	3	–	4	5	2	3	"
5	5	–	–	–	–	–	–	–			4	4	4	4	–	4	–	4	4	2	1–2	"
5	5	–	–	–	–	–	–	–			4	3	3	3	–	4	–	3	3–4	2	3	"
5	5	–	–	–	–	–	–	–			–	4–5	4–5	4–5	–	4–5	–	3	3–4	1–2	2	"
5	5	–	–	–	–	–	–	–			–	4	4	4	–	4	–	3	3	2	2	"
5	5	–	–	–	–	–	–	–			–	4–5	4–5	4–5	–	4–5	–	4–5	4–5	1	2–3	"
5	5	–	–	–	–	–	–	–			–	4–5	4–5	4–5	–	4–5	–	3	4–5	1–2	2–3	"
5	5	–	–	–	–	–	–	–			4–5	3	2–3	3	4–5	4–5	–	5	3–4	1–2	2–3	"
5	5	–	–	–	–	–	–	–			3	2–3	2–3	2–3	3	3	–	4	4	1–2	2–3	"
5	5	–	–	–	–	–	–	–			–	4	4	4	–	4	–	3	3–4	1	–3	"
5	5	–	–	–	–	–	–	–			–	4–5	4–5	4–5	–	4–5	–	4	5	1	3	"
5	5	–	–	–	–	–	–	–			–	4	4	4	–	4	–	3–4	3–4	1–2	2	"
5	5	–	–	–	–	–	–	–			–	3–4	3–4	3–4	–	4	–	4–5	4	1–2	2–3	"
5	5	–	–	–	–	–	–	–			–	3	4	3	–	4	–	3	3–4	1–2	3	"
5	5	–	–	–	–	–	–	–			–	3	3	3	4	3	–	3	5	1	3	"
		–	3	3	3	–	3	–			4	1	1	1	4	2	–	4–5	3–4	2	1	
		–	3	3	3	–	3	–			4	1	1	1	4	2	–	4–5	3–4	1–2	2	
		–	4–5	4–5	4–5	–	4–5	–			–	4–5	–	4–5	–	4–5	–	1–2	3–4	1–2	3	Bleeds
		–	4–5	4–5	4–5	–	4–5	–			–	4–5	–	4–5	–	4–5	–	2–3	3–4	1–2	3	"
		–	4–5	4–5	4–5	–	4–5	–			–	3	3	3	–	4	–	3	4	2	2	"
		–	4–5	4–5	4–5	–	4–5	–			–	3	3	3	–	4	–	4	3–4	2–3	2	"
		–	4	4	4	–	4	–			–	2	2	2	–	3	–	4	2–3	2–3	3	"
		–	3	3	3	–	4	–			–	2	2	3	–	3–4	–	4	2–3	2–3	3	"
5	5	–	–	–	–	–	–	–			–	4–5	–	4	4–5	4–5	–	4	2	1–2	3	"
		–	4	–	3	4	–	–			4	3	4	3	4	3	–	4	2	1–2	3	"
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	3	1	3	
5	5	–		–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	4–5	1	3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	4–5	3–4	1	2–3	
5	5	–	–	–	–	–	–	–	5	5	–	–	–	–	–	–	–	3–4	3–4	1	3	
		4–5 Y	–	4–5 Y	–	–	4–5 Y	–			4	4	4	4	–	4	–	5	3–4	1	3	
		4 Y	–	4 Y	–	–	4 Y	–			–	4	4	3	–	4	–	4–5	3–4	1	3	
5	5	–	–	–	–	–	–	–			–	4–5	–	4–5	–	4–5	–	3	3	1	3	
5	5	–	–	–	–	–	–	–			–	4–5	–	4–5	–	–	–	3–4	3–4	2	3	

*1 Very Tippy — 3 Not Tippy — 1 Very Selective — 3 Not Selective — – Lighter Tips

TABLE IX
Neutral (metallized) dyes, dry crocking

2% Dyeings	*Deceresol NI Conc Wetting Agent After dyeing*	*Before dyeing*
Calcofast Neutral Yellow G	5	5
" " Yellow 3R	4-5	4-5
" " Orange 2G	5	4-5
" " Brown 5R	5	4-5
" " Red B	4-5	4-5
CI Acid Brown 19	5	5
Calcofast Neutral Blue B	5	4-5
" " Black BG	5	5
" " Scarlet 2G	4-5	4-5
" " Gray B	5	5

Dyeing method: 1¼% Diammonium phosphate
Boil 45 minutes.

TABLE X
Dry crocking ratings—Acid (metallized) dyes

2% Dyeings	*Deceresol Wetting Agent NI Conc *After dyeing*	*Before dyeing*	*Soap and soda ash Before dyeing*
CI Acid Yellow 54	4-5		5
CI Acid Yellow 99	4-5		4-5
CI Acid Orange 34	4-5	4-5	5
CI Acid Red 186	4		4
CI Acid 190	4	4	5
CI Acid Red 189	4		5
Calcofast Wool Blue R Conc	4-5		4-5
CI Acid Blue 158 or 158A	4		4
CI Acid Black 52	4		3(6% dye)

Dyeing procedure: 6% Sulfuric acid
Boil 90 minutes.
*Rinsed at 140°F after Deceresol NI Conc Wetting Agent scour.

dyes. Since a comparison is in order between results on Deceresol NI Conc Wetting Agent prescoured wool and soap and soda ash prescoured wool, the former is included with the results on afterscouring.

With a number of cases of improvement indicated in dry crocking by scouring with Deceresol NI Conc Wetting Agent after dyeing, compared with prescouring with soap and soda ash, there is no indication of any neutral (metallized) dye being poorer.

The dry crocking ratings of neutral (metallized) dyes after dyeing on unscoured, sprayed-only wool followed by afterscouring are satisfactory and compare with ratings of prescoured wool as shown in Table IX.

ACID (METALLIZED) DYES———The study of effect of dyeing on unscoured wool was further projected with regard to dry crocking to the acid (metallized) dyes. The results for several of these dyes on a nonionic prescoured and afterscoured basis are given in Table X.

These dyes are applied in strongly acidic baths where the pHs are approximately at 2 with wool. Under these conditions the wool grease and occluded dye are held by the wool and are not readily removable by cold rinsing.

Afterscouring in alkaline dyebaths to remove the wool grease is not suitable even though staining in some cases on the effect fibers is not objectionable.

TABLE XI

	Highest	Lowest	Average
pH—Neutral (metallized) dyes			
Scoured wool—38 dyebaths	7.35	6.15	6.75
Unscoured wool—38 dyebaths	7.90	6.40	7.15
pH—Acid dyes			
Scoured wool—19 dyebaths	6.75	5.90	6.50
Unscoured wool—19 dyebaths	6.90	6.30	6.77
pH—Direct dyes			
Scoured wool—18 dyebaths	6.70	5.80	6.12
Unscoured wool—18 dyebaths	6.85	6.15	6.42

Because of sensitivity of many of these dyes to higher pH, they change sufficiently in shade on treatment with alkali or neutralizing baths to be objectionable, even after considering that the grease is completely removed.

The neutral (nonalkaline) afterscour afforded by the use of a product such as Deceresol NI Conc Wetting Agent overcomes this objection and with a following

The acid (metallized) dyes require a hot rinse, as isfactory and, as indicated by check tests, are not inferior to results obtained on nonoionic prescoured wool.

With the neutral (metallized), acid and direct dyes the crocking did not seem materially affected by not rinsing after the Deceresol NI Conc Wetting Agent afterscour.

The acid (metallized) dyes require a hot rinse, as above indicated, for satisfactory crockfastness.

OTHER PROPERTIES———The differences observed and noted other than fastness properties were given consideration and found to be as follows:

Of prime importance, we would consider the effect on the wool itself of scouring after dyeing and scouring before dyeing.

Comparisons of the stock, dyed after scouring, with retained grease, show that the fibers of the latter separate more readily, indicating less matting during dyeing, and that felt pads made by fulling the grease containing wool are in all cases firmer or more compact than the corresponding pads made from the prescoured dyed wool. These are good indications of reduction of fiber damage.

pH———A study of the pH (acidity-alkalinity) of the dyebaths after 45 minutes at the boil produced the results shown in Table XI. (The pHs were taken after dyeing was completed and dyebaths were cooled to room temperature). The dyebaths for the three classes of dyes were all based on 30/1 volume ratio, with 1½% ammonium phosphate as the dyeing assistant.

The unscoured wool dyebaths were in all cases, for the three dye classes, slightly higher in pH than those of the prescoured, neutralized wool dyebaths.

FIBER SELECTIVITY———Although most of the ratings for the neutral (metallized) dyes in the tables indicate lighter tips on the fine-grade wool, dyeings of four combination shades on carpet wools in the grease, dyed afer spraying only, all showed darker tips.

Combinations for the carpet wool dyeings were:

0.50% CI Acid Blue 168)
0.50% CI Acid Brown 44)

0.50% Irganol Green BLS)
0.50% Cibalan Khaki GL)

0.50% CI Acid Orange 85)
0.50% CI Acid Red 218)

0.50% Irganol Green 4GLS)
0.50% CI Acid Brown 21)

(% based on the grease weight of fiber).

The tips of the carpet wool clips were evidently damaged by rubbing against the sheep's environment as they were matted and soft before processing.

The tips of the fine wools did not appear damaged and may have dyed differently than the body of the fiber because of physiological differences.

Further examination of the dyed results, including the neutral-dyeing acid dyes and the direct dyes, indicates a lack of specific relationship between the dyeability of the tips and the uniformity (levelness) of the body portions of the fibers.

There are cases of dark and light body portions with dark tips, uniform body portions with light tips, tips and body alike and dark and light body portions with light tips.

It may be incidental, but with the direct dyes, although the body uniformity of the fibers is poor in nearly all cases, the tips of the fibers are in a majority of the cases as dark or darker than the darkest body portion.

This indication of variations in dyeability in the body portions of the fibers, aside from tippiness, is of interest in utilizing dye selection to obtain levelness. It is apparent that because a dye does not dye the tips light it does not necessarily dye the body portions uniformly. It should be considered that the results for fiber selectivity and tippiness as rated are based on dyeings made between pH 6 and 7 for the neutral-dyeing acid and direct dyes and between pH 6 and 7.5 for the neutral (metallized) dyes.

As to the effects of prescouring the wool, in comparison with wool sprayed only and nonionic scoured after dyeing there are not sufficient outstanding differences in tippiness or fiber body uniformity to permit generalization regarding superiority of one procedure over the other.

VAT DYES———One of the procedures for dyeing vat dyes on wool is given in Calco Technical Bulletin No. 819, with formulation for pink, olive green and gray.

If sprayed-only, unscoured wool is used, following the procedure of TB 819, and all accessories are omitted except the caustic soda and hydrosulfite, it will be found that the wool will dye and scour simultaneously, giving uniform exhaust with increasing salt additions where required, not exceeding 120°F in temperature.

Twenty minutes at 120°F after the salt addition gives good color value and fast shades, comparable to dyeing on scoured wool. The prescouring and afterscouring are thus eliminated and processing degradation minimized.

CONCLUSION

The suitability of scouring after dyeing, through the use of a nonionic such as Deceresol NI, is indicated as applicable not only to neutral (metallized) dyes but to acid (metallized) dyes, acid dyes, direct dyes or any dyes that will withstand a low-temperature non-alkaline scouring.

The effectiveness of the non-alkaline scour with Deceresol NI Conc Wetting Agent is indicated by the residual grease figures of 0.48% and 0.42%. This amount has been found not to affect crocking sufficiently to warrant consideration. That Deceresol NI is effective as a prescouring agent as well as being suitable for afterscouring is shown by the crocking comparison of dyeings after three scouring procedures against unscoured.

meta-Bisulfite was used in the scouring because of indications that Deceresol NI was operative at lower temperatures in its presence and cleaner dyeings were obtained.

The potentialities of greater use of dry spun and desuinted unscoured wool are indicated. These can be used for dyeing as such or in mixtures or blends with other fibers, scouring to be carried out at any desirable or suitable stage of manufacture, once the dyeing is completed. This would afford economy in eliminating in some cases the extra cleaning up of goods dirtied in processing, in other cases the elimination of a scouring bath, besides affording the natural protection of the retained wool grease as long as necessary.

It will be noted, from the quantities used in this investigation, that the results obtained are based on laboratory-scale operation. Practical field trials have not yet been made.

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ADR PATENT DIGEST

Paul Wengraf

DYEING AND MODIFYING OF KERATINOUS FIBERS——

Disrupted Disulfide Bonds Replaced by Agents Containing Chromophore Groups

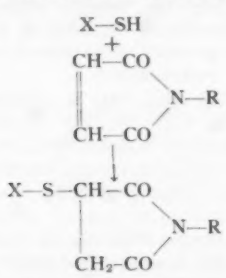
C, 4/06)

U S Pat 2,933,365 (Secy Agric——Moore——April 19, 1960)

The preamble to the current patent refers to known processes in which the disulfide linkages of wool or other keratinous materials, represented by "X-S-S-R", are first disrupted by reducing agents to form two -SH- bonds, whereupon they are relinked by other groups, such as alkyls, to generate more resistant bonds, eg, -S-C_2H_4-S-.

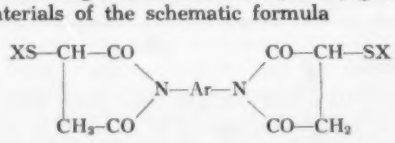
The innovation in this patented method is the relinking the above -SH- groups by agents which contain chromophore groups, thus causing dyeing or pigmenting in situ. Agents of this type are characterized by a content of an olefinic acid group, linked through N to an aromatic residue.

A) When such compounds are reacted to one -SH- group, a dyeing effect results according to the equation



wherein "X" stands for the polypeptide chain of the wool molecule and "R" for an aromatic radical, which contains a chromophore group.

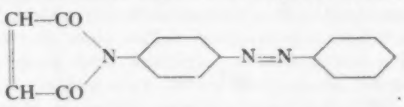
B) When two of the X-SH- groups are reacted with an agent bearing two unsaturated (olefin) groups, fibrous materials of the schematic formula



result, wherein a dyeing and crosslinking effect may be obtained. In this event, chemically modified fibers of increased resistance to alkalis, felting agents, etc, reportedly result (cf col 3, lines 41-55).

Thus mono-imides of dicarboxylic acids or amides of unsaturated acids can be used for obtaining the dyeing effects; and di-imides of dicarboxylic acids or diamides of unsaturated acids may produce the dyeing and cross-linking effect. Numerous suitable compounds of both types are listed in col 3, line 60—col 9, line 57. Treatment of the fiber is carried out in two steps and is described in detail in col 9, line 58—col 11, line 58.

Example: Wool yarn was immersed in an aqueous solution of mercapto-ethanol at 50°C for 30 minutes. The reduced wool material was washed with borax, rinsed, and immersed overnight in a solvent solution of a maleimide substituted by a chromophore group:



After rinsing, the yarn was found to have been evenly dyed a yellow of good fastness.

Among references cited by the Patent Office:

U S Pat 2,615,782/3 (Proctor & Gamble/1952) refers to cross-linking sulfhydryl groups which are obtained by reducing disulfide linkages of keratinous substances by organic thiosulfates, eg, alkylthiosulfates or polythiosulfates of alkanes or alkenes.

U S Pat 2,850,351 (Sec Agric/1958): cross-linking of the sulfhydryl groups in previously reduced keratinous material by treating with di-imides of unsaturated dicarboxylic acids or with diamides of unsaturated monocarboxylic acids. [Cf *Am Dyestuff Reptr 48*, No. 18, 45 (1959)].

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FLAMEPROOFING with Water-insoluble Alginates (G, 2/03)

U S Pat 2,907,683 (Deutsche Erdoel AG——Madeline, Pathus——Oct 6, 1959)

The object of the present invention is to render textiles and other combustible goods nonflammable and incapable of supporting flames upon ignition.

According to the patented method, textiles must first be impregnated with a water-soluble (ammonium, alkali or amine) salt of alginic acid, which must thereupon be precipitated within the fiber by $CaCl_2$ or heavy metal salts, such as those of Fe, Zn or Cu. Calcium chloride is preferred by reason of its hygroscopicity, which prevents the material from drying out

completely. Fabrics so treated reportedly exhibit complete impermeability to gas; some water retention, which protects the goods from flames; and a durable effect, even after dessiccation, so that simple wetting will restore the original qualities of the material.

Example: A porous sackcloth was immersed in a 1.5% solution of sodium alginate, then further treated with a 40% aqueous calcium-chloride solution; after draining for about one hour so that most of the water had been removed, the goods were found to be fireproof.

Among the references cited by the Patent Office:

U S Pat 2,387,865 (Van Kleeck/1945): fire-retardant composition for wool treatment contains an alkali alginate and borax or boric acid.

U S Pat 2,435,701 (Kelco Co/1948): oil-proof paper containers are made with compositions containing, for example, alkali alginate, magnesium alginate, or ammonium alginate.

Brit Pat 625,609 (Courtaulds/1949) calls for coating textiles with colored pigments, which are dispersed in a water-soluble alginate and subsequently insolubilized with metal salts.

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IMPROVING FASTNESS OF SUBSTANTIVE DYEINGS

with Dicyandiamide-Polyamine-Formaldehyde Condensates (C,4/01)

U S Pat 2,902,472 (Arkansas Co, Inc——Cook, Sapers——Sept 1, 1959)

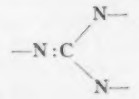
This patent covers a method of manufacture of textile assistants which may be applied in a finishing bath to render direct dyeings substantially resistant to alkaline treatments. It involves using condensates of a nitrogenous compound (dicyandiamide, acrylamide, urea, guanidine) with a low-molecular polyethylene polyamine (triethylene tetramine preferred) and formaldehyde. The condensation takes place in the presence of a low-molecular aliphatic acid, such as propionic, lactic, formic or acetic, at a pH of 4.5-6.0 at 75-85°C. The degree of polymerization is kept under strict control so that a water-soluble condensate of low molecular weight forms, while side reactions which yield relatively high-molecular-weight compounds of lower solubility are avoided. It is essential that no formation of insoluble matter be discernible in the water-soluble condensate subsequent to its standing at room temperature for several months.

Example: 67 p dicyandiamide, 29 p triethylene tetramine, 30 p acetic acid (100%), and 40 p water were mixed in this order and 110 p formaldehyde (37%) finally added. When the mixture was heated in a reactor at 60°C, the temperature rose automatically to 90°C. The condensate was first cooled for two hours at 82°C, then rapidly brought to room temperature.

A cotton muslin dyed with 2% CI Direct Brown 95 (CI 30145), then aftertreated for 20 minutes at 160°F with 6.5% owf of the above condensate, proved to be fast to bleeding in water and did not lose color in a Launder-Ometer test with 0.5% soap solution for 30 minutes at 120°C.

Among the references cited by the Patent Office:

U S Pat 2,364,726 (Ciba/1944): improving the fastness of direct dyeings by applying a condensate of formaldehyde with compounds containing the group



eg, melamine, guanidine or dicyandiamide.

U S Pat 2,631,920 (Ciba Ltd/1953): dyeings obtained with direct dyes and capable of forming complex copper compounds acquire improved fastness properties by an aftertreatment with an aldehyde condensate [cf *Am Dyestuff Reptr 43*, 67 (1954)].

U S Pat 2,649,354 (Sandoz Ltd/1953): condensates of polyethylene polyamines with monomeric or dimeric dicyanamide are used to improve the fastness properties of direct dyeings. [Cf *Am Dyestuff Reptr* 43, 383 (1954)].

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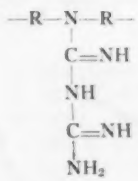
IMPROVING FASTNESS OF SUBSTANTIVE DYEINGS——

Aftertreatment with Metal Complexes of Biguanides of Polyalkylene Imines (C, 4/01)

U S Pat 2,912,295 (Farbenfabr Bayer——Taube, Boeckmann——Nov 10, 1959)

According to the current specification, dyeings with substantive dyestuffs acquire increased fastness properties in wet treatments when aftertreated with a metal (copper) complex of a water-soluble biguanide of a polyakylene imine (preferably polyethylene imine), which contains the units



wherein R = lower alkylene.

Compounds of this type are prepared by condensing treated with a 0.2-0.3% weakly ammoniacal solution under reflux. The metal complex is formed by a reaction of the condensate with crystallized copper sulfate at elevated temperature.

Example: Cotton dyed with a polyazo dyestuff was treated with a 0.2-0.3% weakly ammoniacal solution of the above-described copper complex compound for one-half hour at 70°C; the bath length was 20:1. The wetfastness of the dyeing reportedly was improved considerably.

Among the references cited by the Patent Office:

U S Pat 2,649,354 (Sandoz Ltd/1953): see preceding abstract to U S Pat 2,902,472.

Brit Pat 522,539 (IG Farben/1940): the fastness of direct dyeings is enhanced by a treatment with a solution of a compound which can be obtained in the condensation of a polyalkylene polyamine with dicyandiamide.

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ADR ABSTRACTS

The Improvement of the Wrinkle Recovery of Cotton by Reaction with Formaldehyde

O'Brien, S J and van Loo Jr, W J, *Textile Research J 31, 276-81, Mar, 1961*

There have been many studies in the past on the reaction of formaldehyde and cellulose. The conclusion reached by several authors is that the reaction involves, to some extent at least, the formation of a cellulose methylene ether, Cell-O-CH_2-O-Cell. Many different catalysts and procedures for applying formaldehyde to cellulose have been used, with varying degrees of success.

In the present paper the authors report data obtained on the reaction of various amounts of formaldehyde with a cotton fabric and the effect on the wrinkle recovery of the fabric; and they analyze these data on the basis of a possible mechanism for the process involved in the chemical modification of cellulosic fibers.

Three catalysts were employed by the authors: phosphoric acid, magnesium chloride, and zinc nitrate. Cotton cloth was padded through solutions of formaldehyde of various concentrations with additions of these catalysts, dried at 107°C, cured at temperatures between 165° and 177°C, washed with an anionic detergent and soda ash, and dried.

Wrinkle-recovery measurements, made with the Monsanto Wrinkle Recovery Tester, showed the improvement obtained by these various treatments. The total formaldehyde reacted with the fabric was also determined. The results are tabulated.

It is pointed out that the reaction of formaldehyde with cellulose occurs *after* padding and drying. The formaldehyde in solution is adsorbed by the fiber during padding, but some of it is lost by desorption and evaporation in the drying and baking operations. During the baking, the cotton contracts, and the formaldehyde adsorbed by the fiber reacts with it as indicated above.

A theoretical equation which fits the relationship between improvement in wrinkle recovery and concentration of formaldehyde reacted with cotton was derived, which suggests that only part of the reacted formaldehyde is involved in the cross-linking of cellulose molecules.

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The Cold Pad-batch Method— a New Padding Procedure for Cibacron Dyes

Peter, M and Ulrich, P, *Ciba Rev #140, 39-40, Oct, 1960*

Padding methods in use to date for Cibacron dyes have been mainly designed for continuous dyeing of large batches. The new *cold pad-batch* method, however, is equally suitable for small and large batches.

The working procedure is simple and economical, as follows: the goods are padded through a cold dye liquor containing urea (with some dyes), caustic soda and Glauber's salt, and are then batched up. Fixation of the dye takes place over several hours at room temperature while the batched goods are on the stillage. Following this, the alkaline salt solution is washed off in the usual manner, together with the unfixed dye.

The authors recommend rotating the padded rolls on the stillage during the first half of the fixation period. The total time required for fixation depends on the dye used, the temperature at which the goods are batched (20-30°C), and partly also on the substrate. From 12 to 16 hours gives the maximum yield with most dyes.

The new cold pad-batch method has several advantages. It makes only a limited demand on dyehouse equipment. There is no need of immediate drying (which requires the exercise of some care, owing to the danger of dye migration). Other advantages are good build-up, even of full shades, good reproducibility of dyeings, levelness, good penetration, and the fact that unfixed color is easily washed off.

This method of dyeing has also proved suitable for dyeing cotton/polyester fiber unions with good reservation of the synthetic fiber portion.

•

Fabric-foam Laminates: a New Textile Development

Howard, H S, *Papers AATT, Modern Textiles 42, 50-3, March, 1961*

The lamination of urethane foam to fabrics of all types has gained considerable market achievement in those areas where it has had some experience. The major success of foam-fabric lamination has been in association with all types of knit goods from tricots to bulky knits.

The vital function performed by the urethane foam is to stabilize the dimensionally unstable knit fabrics so that they have good shape retention while retaining good drape characteristics. The foam also imparts wrinkle resistance and warmth, giving cottons the warmth and recovery of wools, and giving light-weight wools the behavior factors of much heavier wool fabrics.

Slower in being adopted, but also growing in use, is the lamination of urethane foam to all types of woven fabrics, where its functions are the improvement of thermal qualities of light-gauge materials, the adding of resistance to wrinkling, and the addition of a new feel and plumpness to otherwise light-weight materials.

The author briefly reviews the history of urethane foam development, which started in Germany during World War II. Its first use in this country was apparently as a cushioning material competing with foam rubber.

A method of combining urethane polyester foam directly to fabrics by a fusion process was developed and led to the adoption of various constructions of knit fabrics with urethane foam backing, for the jacket, car coat and women's topper coat market.

The major urethane foam size used is 3/32″ thick, which fuses to an approximate 1/16″ finished thickness. The foam is put up in 200- and 250-yard rolls of various widths to accommodate different fabrics.

Laminates to terry cloth for bath mats and place mats use foam from ⅛ to ¼″ in thickness. Other laminated fabrics are used for sleeping bags, snow suits, and in shoes, furniture and motor cars.

To sum up, the more important characteristics of polyester urethane foams now on the market are resistance to drycleaning fluids and to soap alkalinity, good air permeability, tensile strength, tear strength, drapeability, good aging characteristics, compressibility, quick-drying properties, heat resistance to 350°F, and freedom from odor. The foams are also resistant to bacteria and mildew, and are non-allergenic, nontoxic and flame-retardant.

The author suggests that mills and converters entering into foam urethane-laminated programs for the first time should seek the advice of an experienced laminator.

Pleats in Terylene can be Permanent! Two Essentials—Temperature and Time

Anon, *New Zealand Textile J*, 36-7, Spring, 1960

It cannot be stressed too strongly, the author says, that to obtain satisfactory permanent pleats in Terylene/wool fabrics (eg, skirts or trousers), the temperature and time must be carefully controlled.

Terylene is a thermoplastic and pressure-plastic material capable of being molded into shape by the application of heat and mechanical pressure, and if the correct techniques are used, pleats and creases of good stability to domestic laundering can be inserted into garments, provided that the Terylene content is 50 percent or more.

Since Terylene has practically no moisture absorption, the effect of water alone in any tailoring process is much less pronounced on it than on wool. Terylene also has a higher resistance to stretch under load than wool, and is much less prone to shrink under the influence of moisture, and these characteristic properties of the fiber are imparted to blends with wool.

The fabric may be placed in cardboard formers and treated in steam at atmospheric or super-atmospheric pressure; eg, for 30 minutes at 100°C, or for 10 minutes at 115°C. Steam pressures greater than 10 psi should be avoided, especially with white fabrics, or yellowing of the wool may occur.

Care should be taken to avoid condensation of water in the pleating chamber, for once the cardboard formers have become wet, bleeding of the dyestuff may occur.

In machine pleating, the pleats are formed by a mechanical knife, and the folded fabric is passed between cylinders heated to 130-140°C. The sublimation fastness of the Terylene dyes and the risk of yellowing the wool limit the cylinder temperature which can be used with safety. To obtain durable pleats, this treatment must be followed by steaming.

Durable pleats may also be produced by Hoffman pressing. High mechanical pressure improves pleat sharpness, but when the metal of the press is in contact with the fabric a permanent glaze may be caused. This will be most apparent at the hems and seams of a garment. Generally a steam pressure of 40 psi is satisfactory, but higher pressures may be used if the dyes are fast to sublimation.

•

Dyeing Blends of Wool and Man-made Fibers

Leddy, J A, *Can Textile J* 78, 41-6, 49-50, Feb 17, 1961

It is impossible to cover all combinations of fibers, and the author confines this article to blends of wool/polyester and wool/acrylic fibers.

Wool/polyester Blends. There are now at least six types of polyester fibers available: Dacron, Series 50 and 60; Terylene; Vycron; Fortrel; and Kodel. Not all of these have the same physical characteristics. All six types, however, dye well with disperse dyes and produce dyeings of excellent fastness.

Dyeing of polyester/wool blends is being carried out today by three different techniques:

1) Dyeing from an aqueous bath at atmospheric pressure. This type of dyeing involves the use of carriers.

2) Dyeing from an aqueous bath under pressure at temperatures as high as 250°F.

3) Dyeing by a pad/Thermofix process.

Methods 2 and 3 both require the use of specialized equipment. Method 1 is by far the most widely used today, and is the only one discussed in this article.

Not all carriers are suitable for all polyester fibers, and a carrier which may be suitable for dyeing polyester fiber alone may not be the best choice for dyeing blends with wool. The carrier should be such that it minimizes the stain of disperse dyes on wool.

Three methods are used for dyeing polyester/wool blends: a one-bath method in which both fibers are dyed; a two-bath method with intermediate scour; a two-bath method with intermediate strip with hydrosulfite (to clear the wool). If dyeing is to be carried out by either the one-bath method or the two-bath method with intermediate scour, then dyes should be chosen that produce minimum staining on wool.

The dyebath for the disperse dyes contains, besides the dyes, mono-sodium and diammonium phosphates and suitable dispersing agents for the dyes. For the wool, neutral and acid metallized, chrome, and neutral-dyeing acid dyes are used, the choice being largely dictated by the shade required and the fastness demanded.

The fibers in the Dacron 60 series are unique in that they are dyeable with both disperse and cationic dyes.

Wool/acrylic Blends. Of these, blends of Orlon 42/wool and Acrilan 16/wool are in greatest volume at present. For most practical purposes the acrylic fibers are dyed with cationic dyes and the wool with anionic dyes.

Two methods are used for dyeing these blends. One method involves the use of an anionic leveling agent with an anionic dye and a cationic leveling agent with a cationic dye. The other method, known as the Geigy I-T method, uses a leveling agent of the opposite nature to the dye, with the object of forming dye complexes to reduce the rate of exhaustion. [Cf *Am Dyestuff Reptr* 49, 272 (1960) for details.]

Wool dyestuffs should be selected not only for their compatibility with modified basic dyes but also for their level-dyeing properties under the existing pH conditions.

The author also discusses the dyeing of Zefran/wool blends.

•

Dyeing Courtelle Acrylic Fiber

Ward, J S, *Dyer* 125, 137, 139, Jan 27, 1961

The author points out that, on increasing the temperature of Courtelle, a change in the internal structure of the fiber takes place rather suddenly between 50° and 60°C. This is the transition from the "glass" to the "liquid" state of the fiber, and is accompanied by a reduction in stiffness (increase in plasticity).

The transition temperature differs according to whether the fiber is wet, when the change is effective at 60°C, or dry, when effective transition occurs at 140°C.

This behavior is typical of acrylic fibers, and has an important bearing on the processing technology and behavior in use of Courtelle.

Below the transition point, the fiber is resistant to chemical attack and to dyestuffs, the dyed fiber is resistant to washing, solvents and chemicals, and there are no problems of creasing, glazing and dimensional stability in handling fibers, yarns and fabrics.

Above the transition point, the fiber is accessible to dyes and chemical reagents, dyes in the fiber are susceptible to removal by washing, solvents and stripping processes, the fiber is able to accept permanent or temporary set (ie, pleats), any temporary set applied previously is released, as in the high-bulk process, and there may be handling problems of yarn and piecegoods, causing stretching, creasing or glazing, unless adequate care is taken.

(*concluded on page 60*)

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Rhode Island Section———

THE APPLICATION PRINCIPLES OF ACRYLIC BACKCOATING*

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For many years fabrics have been backcoated to upgrade their end-use characteristics. Added body and ravel resistance were among the first improvements obtained through backcoating. Chemical improvements in the binding agents have greatly enhanced their durability to wet processing. With the ever-increasing trend to highly styled fabrics containing long floating designs, a major portion of the strength burden is placed squarely on the resin binder.

Because of the important role of the backcoating binder, excellent strength, processing and aging characteristics are prerequisites for the resin. The superior aging characteristics of the acrylics on exposure to heat and/or sunlight and their ease of compounding are principal reasons for the evaluation and acceptance of these resins for various backcoating operations.

This paper deals with some of the major facets of the backcoating industry—upholstery fabrics, carpeting and apparel.

INTRODUCTION

THE backcoating of fabrics has long been an important process in the textile industry. Such a treatment may serve a variety of functions—reduction of ravel, anchorage of yarns, prevention of slippage, addition of body to the fabric, improved abrasion resistance, greater strength and good wet processing durability.

Originally, backcoating was done with starch and clay mixes, but the brittle film tended to flake or powder from the fabric and had negligible wet processing durability. Many types of durable backcoatings have since been developed to overcome these disadvantages. However, the new materials do require more complex compounding than the filled starch mixes.

The general acceptance of acrylics in the backcoating field is largely due to their chemical inertness after application, particularly with respect to their superior aging characteristics on exposure to heat and sunlight (ultraviolet exposure). In addition, the clarity of the acrylic films and the stability of acrylic dispersions through a wide pH range, make them well-suited to backcoating operations. In this paper, we will deal principally with the backcoating of fabrics which fall within the following classifications:

Automotive upholstery fabrics
Yarn-dyed and post-dyed furniture upholstery fabrics
Carpeting
Miscellaneous applications

DISCUSSION

COMPOUNDING VARIABLES——Before a fabric can be backcoated with binder, the binder has to be treated or mixed with other ingredients. This process is known as compounding. It is not unusual to find six or eight ingredients in a compounded formulation in addition to the universal diluent, water (*1*). The ingredients encountered might be:

A binder or binder combination made from natural rubber, synthetic rubber, polyvinyl (polyvinyl chloride or polyvinyl acetate) or a polyacrylic (one of the many acrylic esters).

Crosslinking or vulcanizing additives, such as sulfur, zinc oxide and accelerators in the case of rubber; or thermosetting resin and catalyst in the case of certain functional acrylic polymers. Here, it should be mentioned that some self-crosslinking acrylic resins are now available.

A filler, such as clay, calcium carbonate or titanium oxide for whiteness.

A dispersant for the filler.

A wetting agent for better penetration of non-absorbent fabrics.

A thickener to control degree of penetration.

Alkali for pH adjustment and/or for greater stability of the mix.

A plasticizer for greater softness and freedom from cracking at a high level of loading.

Antifoam to assure good coating consistency and uniform coverage.

BACKCOATING METHODS——The next step is to provide the necessary equipment to backcoat the compounded mix onto the fabric. Backcoating resins can be applied by any of the conventional methods, including knife-coating, spray coating and kiss-roll application. The most common method is the kiss-roll applicator which can be adjusted in many ways to achieve a variety of effects.

As its name implies, the kiss-roll applicator is basically a roller-coating method in which the fabric creates a small arc over the revolving roll, which is partially emersed in the backing mix (*2*). The roll can be made to travel either with or against direction of the fabric at the same speed or the speed can be varied. Any excess mix applied to the fabric by means of the rotating roll can be removed by one or more doctor blades and returned to the trough. There are many variations of this type of equipment, some of which are:

1) A second roll situated directly above the kiss-roll applicator which can be pressed against the face side of the fabric to push the fabric backing firmly against the kiss-roll applicator. The purpose of this would be to obtain maximum penetration.
2) In addition to the doctor blades used to remove excess resin from the back of the fabric, doctor blades are also frequently placed in contact with the kiss-roll applicator to control the amount of resin picked up by the roll before it makes contact with the fabric.
3) Further, the kiss-roll applicator may be engraved so that it picks up more resin than it would if it had a smooth surface.

Practically all of the innovations mentioned are adjustable so that they can be altered to suit optimum conditions for treating a particular fabric. These optimum conditions generally are determined by mill experience so that some degree of artistry is involved. Needless to say, the modifications which can be made with respect

*Presented October 28, 1960 before the Rhode Island Section at the quarters of the Providence Engineering Society, Providence, RI

to coating by changing the adjustments of the equipment are supplemented by the compounding variables, particularly the degree of thickener in the mix.

Backcoating by means of spraying does impart maximum softness to a coated fabric but has some undesirable features, such as the tendency to coat and accentuate protruding fibers from a fabric surface. This problem can be greatly minimized by placing some sort of rod or doctor blade after the spray apparatus to spread out the droplets clinging to the protruding fibers before drying. However, when this is done, the binder is more likely to dry in the form of a continuous film and the finish will closely resemble that obtained by roller coating. Also, it is frequently necessary to clean spray nozzles to avoid clogging. An efficient exhaust system is needed at the point of spray to prevent a fine resin mist from settling over the immediate area of the plant.

Another backcoating method which is not generally used in the application of water-based systems is the floating knife. The floating knife, which is built like a doctor blade, rides or floats on the surface of the fabric (frequently supported on the underside by a roll or apron). In this system, the coating mix is poured directly onto the fabric and is spread across the substrate uniformly by the forward motion of the fabric as it passes under the knife. The thickened mix rolls into a bank at the junction of the fabric and knife and is contained in the coating area by placing tapered blocks at the selvedges. Occasionally, the mix is allowed to run off the sides of the fabric and return to a trough where it can be again poured onto the fabric surface either by hand or by means of a pump.

A COMPARISON OF VARIOUS RESIN PROTOTYPES ——— Before discussing the various aspects of backcoating with acrylic resins, let us review briefly other types of elastomers widely used in the textile backcoating industry. Three rubber latices—natural rubber, GRS-2000 and GRS-2105—are the basic backbone polymers used in rubber backcoating. Other latices, such as high-styrene-containing dispersions, polyvinyls or polyacrylics, can be used to modify the properties of these base latices.

For many years, practically all of the elastomeric binder used was natural rubber obtained from the cultivated tree, *Hevea brasiliensis*. During World War II, manufactured rubber was firmly established so that today the elastomeric market is shared by natural and various types of synthetic latex.

The fluctuating price of natural rubber, caused by periodic changes in import duties, frequently makes it necessary to use the more stable-priced synthetic latices. Most rubber compounders have designed their formulations so that either natural or synthetic latex can be used to make the most of any price advantage. Natural rubber is imported from the Far East as well as from Brazil, Bolivia, Ecuador, Nicaragua and Liberia.

The inherent softness of natural rubber gives it a very high loading or filling capacity which makes it quite desirable for carpet backing. Neat latex is too soft and elastic for most commerical uses so fillers are added to serve as reinforcing agents for the latex and increase hardness, stiffness, tensile strength and resistance to cutting, tearing and abrasion (*3*).

The discoloration of natural latex on aging with exposure to heat and light presents a serious problem. The unsaturation of the polymer is responsible for this "browning" as oxidation occurs. Unsaturation imparts resiliency or "bounce" to the polymer. Increased discoloration (oxidation) stiffens the polymer and decreases resiliency.

Of the synthetic latices used, the GRS type (Government Rubber, Synthetic) is by far the most popular. The all-purpose GRS accounted for some 87% of all the synthetic latices produced during World War II (*3*). These materials are basically combinations of butadiene and styrene made up in different proportions of the two monomers to suit specific applications. GRS-2000 is an all-purpose hot synthetic (the polymerization is carried at high temperatures) which contains 46% styrene and 54% butadiene (*4*). GRS-2000, at approximately 40% total solids, is the most economical synthetic latex. It has a fair degree of film strength but lacks the flexibility of certain of the other synthetics. It ages with less change in physical properties than natural rubber but is sometimes objectionable because of its strong residual odor caused by the high styrene content.

The other GRS type of synthetic latex which is widely used is GRS-2105, a cold-type dispersion containing 26% styrene, which makes it softer and more rubbery than GRS-2000. GRS-2105 has better low-temperature flexibility than GRS-2000 and is supplied with a total solids content of from 60% to 63% (*4*). This material is somewhat more expensive than GRS-2000, which can limit its use on economy-styled fabrics.

Now let us consider the acrylic resins, their physical forms and the variety of modifications which can be manufactured to suit the particular requirements of the textile backcoating industry. Practically all of the acrylic resin binders used in backcoating today are prepared in the form of aqueous dispersions. These materials generally contain a total solids of 45% to 50% and are usually dispersed with nonionic or anionic surfactants. The use of synthetic surface-active agents to disperse the acrylic monomers during emulsion polymerization results in a product of superior chemical stability, particularly with respect to changes in the pH of the formulation. A high degree of mechanical stability is also achieved, which permits pumping and high-speed agitation. It is a well-known fact that the rosin soaps used to disperse latices are quite sensitive to the addition of any material which lowers the pH of the system. This is the reason that it is necessary to maintain rubber latices on the highly alkaline side.

The acrylics are not unsaturated as are rubber latices. Their satisfied configuration is largely responsible for their superior aging characteristics. For the most part, the acrylics may be regarded as linear or two-dimensional polymers. Polymers based on esters of acrylic acid will be soft, and will impart a soft backing to fabric. (Butyl acrylate is softer than methyl or ethyl acrylate). Stiff polymers may be produced by copolymerization with methacrylate esters, particularly methyl and ethyl methacrylate. Such copolymers impart a firm hand to backcoated fabrics (*1*).

Where improved durability and strength characteristics of acrylic resins are required, certain functional groups may be introduced into the polymer so that the material can crosslink and become three dimensional. The choice of a functional group or groups will determine the type of crosslinking which occurs and the manner in which the dispersion must be handled in order to effect crosslinking.

There are two commercially recommended methods of crosslinking acrylic resins. The first is by the addition of an external crosslinking

material which, on acid catalysis and curing, reacts with the functional group of the acrylic to produce a durable material. The newest approach is through the use of acrylic dispersions which have the necessary functionality built into the basic polymer and require only the addition of an acid catalyst and heat to initiate the reaction.

BACKCOATING AUTOMOTIVE UPHOLSTERIES —— For many years, the automotive industry used pile or plush fabrics for practically all of its upholstery requirements. During the late thirties and especially after the Second World War, there was a definite trend away from these pile fabrics to highly styled woven fabrics containing some of the new, more attractive synthetic yarns. The change in construction to woven fabrics with long floating designs to add eye appeal created a serious problem in regard to strength characteristics, and it became necessary to reinforce the substrate with some sort of resin binder. For a time, the basic resin binder for automotive upholstery backcoating was the all-purpose GRS-2000 which was usually filled with clay or whiting (using about 60-100 parts of filler to each 100 parts of rubber solids). The amount of backing required to perform the reinforcing function varied from three to four ounces per linear yard of fabric. However, the automotive industry soon learned that reinforcement of the fabric for strength characteristics was not the only problem with which they would be confronted. As mentioned earlier, GRS-2000 as well as the other types of latex discolors on aging or prolonged exposure to heat or sunlight. The "grin-through" (where the backing can be seen from the face side of fabric) tended to discolor and ultimately caused the fabric face to take on a rather objectionable appearance. Even without discoloration, the fact that the rubbers generally require a filling agent meant that the backing had a translucent or opaque appearance and this in itself was sufficient to detract from the attractiveness of the fabric when "grin-through" occurred. It was inevitable that the acrylics, with their water-like clarity and superior aging characteristics as well as their ease of compounding and excellent adhesion to synthetic fibers, should gain a foothold in the automotive upholstery backcoating industry.

Since automotive fabrics are usually yarn dyed, there is little need for durability to wet processing of the backing. The acrylic resins do not require antioxidants or vulcanizing agents; all that is required is to apply the binder from a thickened solution followed by drying. In addition to the conventional types of automotive upholsteries (ie, yarn-dyed combinations of cotton and synthetics such as nylon or rayon, which occasionally contain a novelty yarn, like Mylar), there are also automotive fabrics constructed from temperature-sensitive yarns such as Saran, polyethylene or polypropylene. Accurate temperature control will cause uniform shrinkage of these yarns and produce attractive embossed or puckered designs which remain throughout the life of the fabric. The use of acrylic resins, which can be dried at any convenient temperature, greatly facilitates the plant technique for controlling shrinkage. In addition to the use of acrylic backcoating to improve the physical characteristics of automotive upholstery fabrics, such as wear life, seam strength and fray resistance, it should be pointed out that the acrylic resins are capable of being heat sealed. This process has been widely used by the automotive industry to dielectrically heat seal a vinyl/nonwoven/hardboard laminate to create beautifully embossed effects on door panels. The various requirements of a heat-sealable backing are currently being studied. Dielectric heat sealing involves the passage of an alternating current through a resin so that the polar groups of the specific resin are caused to oscillate rapidly. This rapid oscillation results in the creation of heat, which causes fusion and thus cements the resin to its neighboring substrate.

One of the newest problems in the field of automotive upholstery is the tendency of fabrics containing spun yarns to pill excessively and exhibit rather inferior wear life. It has been found that the face treatment of these fabrics with an acrylic resin will cause a significant reduction in pilling and greatly enhance the wear life of the fabric. While it is true that face treatment generally causes some delustering to take place, this is kept to a minimum with the clear acrylic resins.

As stated previously, the acrylics generally exhibit excellent adhesion to synthetic fibers. Some of the latest fibers, particularly polypropylene, make it rather difficult to get good adhesion even when acrylics are used. The pre-saturation of these synthetic fabrics with a dilute solution of the acrylic resin prior to backcoating provides a base or anchor coat so that resin-to-fabric adhesion is greatly improved.

As is the case with rubber latex, the very soft acrylics tend to be tacky and this tackiness can interfere with plant processing ("blocking") or cause delays during the upholstering process. A tacky face-finish may soil excessively. There are several methods which can be used to control or minimize tackiness, one of which is through the use of the functional polymers which can be made to crosslink and thereby minimize the inherent tackiness of the polymer. Another method is through the incorporation of a softener or lubricating agent, such as a polyethylene emulsion. Also, an emulsified wax, which comes to the surface of the resin binder on drying, can be added. Even a small degree of filling or loading will eliminate this problem so that most of the objections which are encountered are in clear backings.

The amount of acrylic backing required to produce an acceptable end product for automotive upholstery fabric is usually considerably less than the amount of compounded rubber which is needed. As stated previously, amounts of three to four ounces per linear yard of filled rubber are utilized where only one to two and one-half ounces of clear acrylic solids per linear yard will suffice. While the cost per dry pound of acrylic mix can be higher than that of rubber, the overall finishing cost is quite competitive. At the present time, the majority of all automotive upholstery fabrics are backed with acrylic resins.

BACKCOATING FURNITURE UPHOLSTERIES —— For many years, pile or plush fabrics dominated the field of furniture upholsteries. Once again, they gradually gave way to highly styled woven goods with long floating designs which necessitated physical reinforcement by means of a resin backing. The technology involved in backcoating yarn-dyed furniture upholstery fabrics closely parallels the processes used for backcoating automotive upholstery fabrics. Since there is little need for durability to wet processing of the backing, the primary function of the backcoating is to upgrade the handling characteristics and wear life of the fabric. It should be noted that predyed furniture upholstery fabrics more regularly require the use of filling agents than do automotive up-

holstery fabrics. This is principally for reasons of economy.

Furniture upholsteries which must be subjected to rather severe dyeing cycles are backcoated in the griege to maintain the integrity of the fabric. Dispersed acetate, premetalized and direct dyestuffs are commonly used in the dyeing operation. The dyeing cycle may vary from four to eight hours depending upon the time required to obtain uniformity and the desired shade. The tougher fabrics, those containing nylon as is found in many of the friezes, are usually beck-dyed in rope form. The rope-dyeing technique at elevated temperatures for long periods of time subjects the fabric to a tremendous test of strength, which means that the durability of the backing to reinforce the fabric is of paramount importance. Here it is necessary to utilize one of the functional acrylic resins which are capable of crosslinking to provide the needed durability. The more delicate fabrics are dyed in the open width.

An objection frequently raised when rubber latices are used to backcoat furniture upholstery fabrics is that, on dyeing, the backing takes on a different shade than the fabric face, resulting in unsightly "grin-through". This is particularly noticeable on fabrics of a rather open construction, where a significant amount of backing is evident on the face side. The reason for this "shading" effect is the tendency of rubber latices to resist dyeing or to preferentially absorb one of the dyes used in the color formula with a resultant change in cast. The dyeing characteristics of the acrylic resins closely resemble those of the fabric so that "grin-through" is effectively camouflaged. This can be used to advantage in fabrics of open construction where the colored resin actually contributes to the depth of shade.

Generally, an acrylic backing will absorb about 10% more dyestuff than an equivalent weight of latex backing. However, it is frequently possible to use less acrylic binder than latex to achieve the desired finish, which minimizes this absorption phenomenon. If we were to dye a film of acrylic and a film of a typical backcoating rubber, such as GRS-2000, we would notice a decided color yield in favor of the acrylic. This is partially due to the clarity of the acrylic and partly to its fiber-like affinity for the dyestuff. The favorable color yield means that no increase in the initial charge of dyestuff is required. The color of a dyed rubber film is somewhat hampered by its "smoky" appearance imparted by vulcanizing agents, antioxidants or accelerators. Furthermore, the acrylics can be dyed with the economical copper-containing dyestuffs without fear of the backing becoming stiff on storage. The savings in the cost of dyestuff far outweigh any increase in dye absorption of the polymer.

Occasionally, objection is made to the "plastic" rather than "rubbery" hand imparted by acrylic backings. This is understandably brought about by the industry's long association with rubber latex-backed fabrics. While it is definitely true that the acrylics are not completely rubber-like, a folded piece of acrylic-backed fabric will generally overcome deformation to the same degree as would a rubber-backed piece of fabric although the rate of recovery will not be as rapid. Several years ago, hand seemed to be a serious limitation to the use of acrylics for backing automotive upholsteries. Yet today, the major portion of all the automotive upholstery fabrics being backcoated use acrylic resins.

CARPET BACKCOATING

Backing compounds for carpeting, as they are now used in the textile industry, are largely based on either natural or GRS-type rubbers. The compounding of natural or synthetic rubber is an intricate operation frequently provided by latex formulators. Where mill capacity is sufficient to justify this operation, compounding may be done on location. A compounder who provides the basic function of mixing the necessary ingredients of a rubber backing may deliver a "high solids" mix to the mill where it is diluted and re-thickened. This is done for reasons of economy. The thickening agents required by natural latex are quite viscous and their incorporation is often slow and tedious.

In many carpet constructions these latex compounds perform satisfactorily. However, there is a growing interest in backing formulations which exhibit better adhesion, resistance to discoloration, resistance to stiffening, greater ease and versatility in compounding, and acceptable economy. The acrylic polymers, by virtue of their chemical and physical stability, are noteworthy candidates for consideration in this field.

Carpets may be divided into two broad categories, economy styled and high quality. Within each category, the basic construction may be woven or tufted. Carpets with knitted backings will be discussed in a later section.

Economy-styled carpets are usually backcoated with filled or clay-containing mixes to reinforce fabric construction (anchor pile yarns), impart resiliency and skid resistance and add scale weight. A tufted carpet may be further stabilized by the addition of a jute scrim which is either laminated to the rug by pressing it onto the still wet backing or subsequently laminated as a separate operation.

Loading or filling of the mix is generally accomplished with a clay although whiting (calcium carbonate) is frequently used. Many economical latex backings are loaded as high as 350 to 400%, clay solids based on the resin solids, in formulations containing a total solids of 65 to 70%. As much as 16 to 20 ounces solids per square yard of such a formulation may be used. Because of the cost factor, the acrylics have not attained as wide a degree of acceptance in this type of rug backing as they have in other backcoating applications.

The principal reason for backcoating high-quality carpeting is to insure maximum tuft lock and modify the hand. In the case of loop pile carpeting, good tuft lock is essential to prevent a continuous face yarn from slipping out of position and causing a depressed or stripped effect along the linear dimension of the carpet. Loading is common but not necessarily essential. A good backing for high-quality carpet must be tough, durable and occasionally clear.

Because of the thick jute construction, it is often necessary to add as much as 0.5% of a nonionic detergent (based on the total mix) to insure penetration of the jute by the binder so that it reaches the base of the face yarns and anchors them firmly. Some mills steam the carpet back immediately before backcoating to further enhance penetration.

Some of the newer styles of carpeting are subsequently laminated to a preformed foam or the foam is formed "in situ" on the underside of the carpet to provide a permanent underlay. When this is done, it is important that the backing exhibit excellent adhesion to the foam. Curing conditions currently used for natural and synthetic rubber are usually quite adequate for processing acrylic polymers.

STABILIZATION OF FABRICS WITH KNITTED BACKINGS

Fabrics of increasing popularity are those which have knitted backings,

such as the synthetic pile fabrics. Carpets with knitted backings can be included in this category. These fabrics require stabilization of two general types. The first type is dimensional stabilization which minimizes diagonal distortion of the fabric on handling. The second type is that which improves the resistance to shrinkage on laundering. Both of these types of stabilization may be obtained by backcoating the fabric so as to weld the knitted links into a permanent position in their relation to one another.

The procedure for backcoating fabrics of this type is generally similar to other backcoating operations, that is, equipment usually consists of a kiss-roll applicator and a doctor blade. The backcoated fabric is framed immediately after treatment for a simultaneous dry/cure operation. Best results can be obtained by overfeeding the knitted fabric into the drying chamber to insure a state of relaxation before bonding is accomplished. Where treated knit goods are destined for use in apparel applications, a soft hand is usually desirable. Heavier constructions, such as carpeting, will tolerate the use of firmer backcoating materials.

These formulations, when properly applied, will stabilize pile fabrics with knitted backings against diagonal distortion and improve their drapability. An untreated knitted pile fabric which has an area shrinkage after laundering of about 15% can be reduced to an area shrinkage of less than 5% by one of the prescribed treatments. Normally, laundering is defined as machine washing similar to that which is done in the home at temperatures around 140°F for an actual washing cycle of about 20 minutes and a complete laundering time of about forty-five minutes. Approximately 0.5% of a built detergent (based on total bath) is used. The need for wet-processing durability is met quite satisfactorily with one of the functional acrylic binders which is capable of crosslinking.

It was mentioned earlier that aminoplasts can be added as external crosslinking agents which, on acid catalysis and curing, react with the functional group of the acrylic to produce a durable material. While there may be some reaction between the aminoplast and the fiber, it is generally believed that the stabilization effect imparted by backcoating is almost entirely mechanical since there is only a small amount of thermoset present (usually 2 or 3% to crosslink with the acrylic resin).

The ability of the new self-crosslinking acrylic binders to impart a degree of fabric stabilization by chemical as well as by mechanical means is being studied. However, as a backing, the type of stabilization obtained is again almost entirely mechanical.

SOLVENT-POLYMERIZED ACRYLICS——Solvent-soluble acrylic ester resins have long been of commercial importance for such practical applications as coatings, adhesives, moldings and castings. These materials have all the aging characteristics of the aqueous dispersions. When an acrylic film is cast from a solvent system and compared with the film of an aqueous dispersion of identical chemical composition, the solvent-based resin will be softer because of its lower molecular weight. The solvent-based resins have a natural hydrophobicity, which makes them particularly suited for water-repellent and waterproof finishes. In this field, the acrylics generally compete with polyvinyl butyral.

As the need for solvent-based resins for textiles becomes more apparent, two modifications seem necessary. First, it will be necessary to design a volatile solvent system which can be removed rapidly yet safely with existing textile equipment. Secondly, it will probably be necessary to use a two-coat system; a soft tacky base or tie-coat followed by a flexible nontacky topcoat. Incidentally, the solvent-polymerized acrylics, like their aqueous-based cousins, can also have reactive sites built right into the basic polymer to insure maximum durability characteristics.

The degree of polymerization can be carried on to such an extent that backcoating viscosity will be provided without the need for an external thickening agent. The solvent-based acrylics can be colored or pigmented to enhance the appearance of the coating. For maximum durability, pigment should be "sandwiched" between a clear basecoat and a clear topcoat so as not to interfere with adhesion. A clear topcoat also means that good crock resistance can be expected. The naturally high luster and sheen of the solvent acrylics can be used to advantage in certain applications. For a semigloss finish, a standard "dusting" procedure with talc or mica is required.

CONCLUSION

In recent years, acrylic homopolymers and copolymers have made noteworthy gains in the backcoating field. Chemical and physical modifications of the acrylic resins can be made to suit many specific requirements.

Ever-increasing volume production and recent price reductions have placed the acrylics in a much more favorable position than was the case some years ago. It is expected that this trend will continue.

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PROCEEDINGS OF THE AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS

Mid-West Section———

DYEING ZEFRAN ACRYLIC FIBER IN BLENDS*

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INTRODUCTION

ZEFRAN acrylic fiber possesses many of the well-known physical and chemical properties commonly associated with this family of fibers but differs in its dyeing characteristics. It was designed structurally to take advantage of existing classes of dyestuffs such as vat, naphthol, sulfur, neutral premetallized and after-treated direct. These dyeing characteristics allow the dyer of today to realize a wide color range in blends with wool, cellulosic and polyester fibers. Good shade control is attained with single-bath dyeing methods on conventional dyeing equipment.

DISCUSSION

ZEFRAN ACRYLIC FIBER BLENDED WITH WOOL———One of the major applications for Zefran acrylic fiber is in blends with wool for men's, women's, and children's apparel. Commercial fabrics containing Zefran acrylic and wool are currently being produced in a number of leading woolen mills. Although the discussion in this paper is concentrated on piece-dye styling, stock-dyed and over-dyed/stock-dyed styles are also being produced commercially.

Fabrics containing Zefran acrylic and wool are prepared for dyeing in much the same manner as all-wool fabrics. When fulling and/or carbonizing is necessary, it is recommended that these processes be carried out prior to dyeing. Fabrics composed of Zefran acrylic and wool, like other synthetic-wool blended fabrics, shrink to a lesser degree during fulling than do all-wool fabrics of similar construction. This point is illustrated in Figure 1 by a plot of the actual fulling shrinkage of a series of woolen-type fabrics of identical construction containing various amounts of Zefran acrylic. Note that the fabric containing 50% of Zefran acrylic and 50% of wool exhibits less than 4% filling shrinkage during fulling: however, shrinkage will vary for different constructions.

Fulling soaps normally used for fulling all-wool fabrics can be used for fulling blends of Zefran acrylic and wool. Best results are obtained by using a cationic softener, such as Lupomin Q (a quaternary fatty acid amide), followed by a thorough scour with a nonionic detergent in the dolly washer.

Specific carbonizing recommendations are not possible due to variations in equipment and conditions from mill to mill. It is suggested, however, that drying and baking temperatures be held at a minimum, preferably not over 190°F for drying and not over 220°F for baking. As is the case with many other synthetic fibers, elevated temperatures may alter the dyeing characteristics of Zefran acrylic fiber. The fabrics must be properly and uniformly neutralized following carbonizing in order to produce level shades.

Piece goods containing blends of Zefran acrylic fiber and wool can be dyed to a broad spectrum of union shades by employing a single-bath dyeing method with a dyeing cycle of three to four hours. The technique capitalizes on the specific behavior of neutral premetallized and selected acid dyestuffs when applied to blends of Zefran acrylic and wool. Under normal dyeing conditions, most neutral premetallized dyestuffs exhibit preferential affinity for Zefran acrylic and dye the wool to a considerably lighter shade, as illustrated in Figure 2. The final distribution of the dyes between Zefran acrylic and wool, as shown in Figure 2, is dependent on the initial concentration of the dyestuff in the dyebath. On the other hand, Figure 3 illustrates selected milling acid dyestuffs which dye the wool component in preference to Zefran acrylic. A wide range of un-

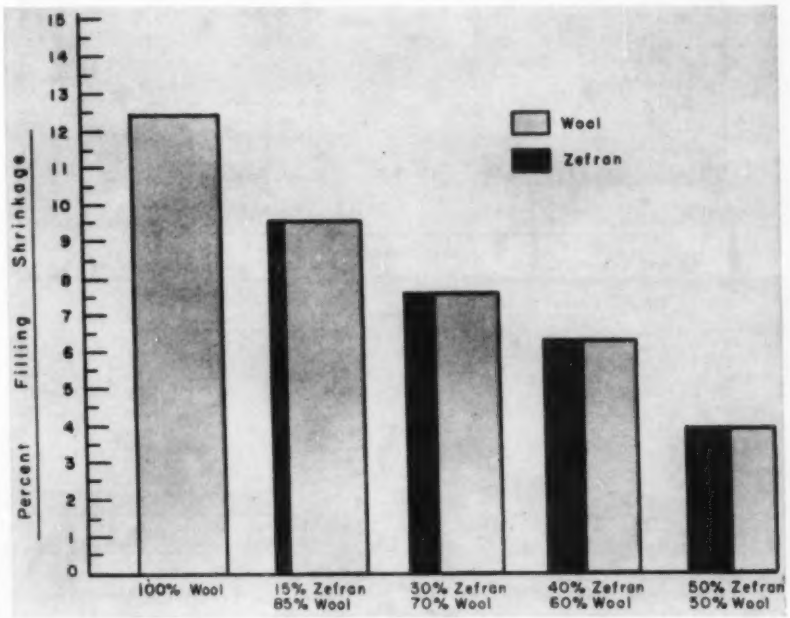

Figure 1
Shrinkage in fulling of Zefran and wool blends

*Presented before the Mid-West Section in Chicago, Ill, on October 29, 1960, by S Helfand, Textile Development, Textile Fibers Department, The Dow Chemical Company, Williamsburg, Va.

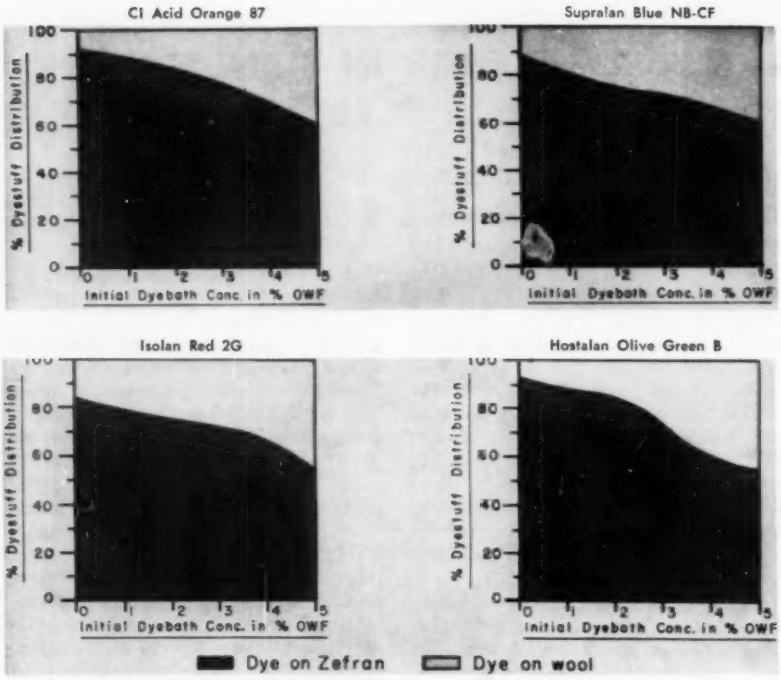

Figure 2
Distribution of neutral premetallized dyestuffs on 50/50 Zefran and wool
(Dyed at a boil for one hour—pH 6.5)

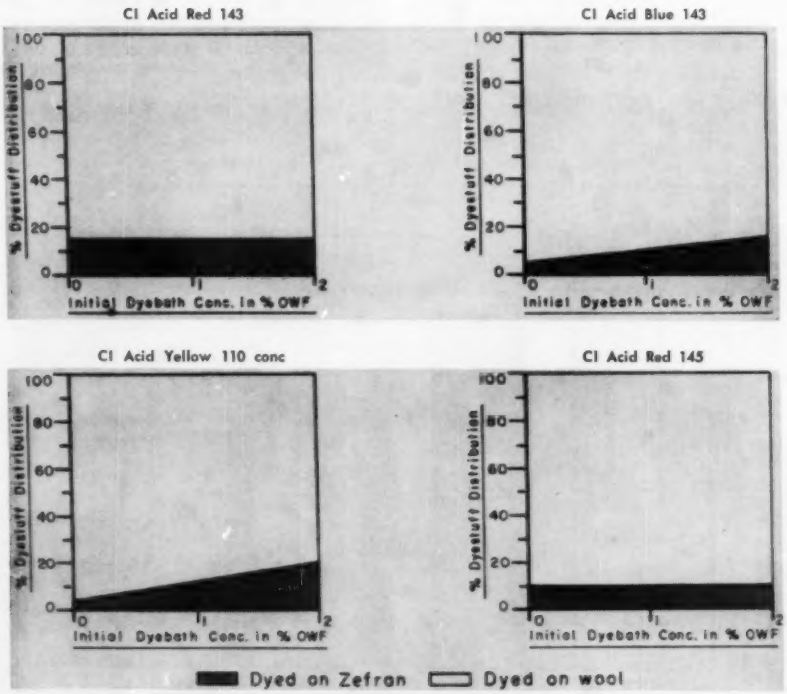
CI Acid Red 143
CI Acid Blue 143
CI Acid Yellow 110 conc
CI Acid Red 145
% Dyestuff Distribution
Initial Dyebath Conc. in % OWF
Dyed on Zefran
Dyed on wool

Figure 3
Distribution of milling acid dyestuffs on 50/50 Zefran and wool blends
(Dyed at a boil for one hour—pH 6.5)

TABLE I
Typical formulation for piece dyeing blends of 50% Zefran acrylic fiber and 50% wool employing neutral premetallized and milling acid dyestuffs.

Light Olive Green
Set bath with 20.0% sodium sulfate
1.0% Capracyl Leveling Salt (nonionic surfactant)
5.0% ammonium sulfate (pH 6.5)
Circulate bath at 80°F for five minutes
Add 1.0% Supralan Olive Green BA
0.30% Capracyl Green 2Y
0.15% CI Acid Yellow 110 conc
0.40% CI Acid Blue 143
0.05% CI Acid Red 143
Raise to a boil (2°F/min)
Boil 60 minutes
Cool and rinse

TABLE II
Typical formulation for piece dyeing blends of 50% Zefran acrylic fiber and 50% wool employing direct and acid dyestuffs.

Turquoise
Set bath with 20.0% sodium sulfate
3.0% Albatex HW
2.0% acetic acid (56%) pH 4.5—5
Circulate bath at 80°F for five minutes
Add 4.0% Pyrazol Fast Turquoise FBL
0.40% CI Acid Blue 9
0.18% CI Acid Blue 90
Raise to a boil (2°F/min)
Boil 60 minutes
Add 40.0% sodium sulfate over last 30 minutes
Cool and rinse

ion shades with excellent control of the dyeing system is obtained by simultaneous application of both classes of dyes—neutral premetallized on Zefran acrylic fiber and milling acid on wool, as shown in Figures 2 and 3. A typical procedure for piece dyeing blends of Zefran acrylic and wool employing this method is shown in Table I.

In the event the shade desired is somewhat brighter than that obtainable with neutral premetallized dyestuffs, selected direct dyes may be applied to Zefran acrylic. Again, union shades are obtained by a one-bath method. Good shade control is ensured by the addition of 3.0% (owf) of Albatex HW (sodium salt arylsulfonic acid; anionic) to the dyebath. The effect of Albatex HW on the distribution of selected direct dyestuffs between Zefran acrylic and wool is shown in Figure 4. Table II illustrates a typical procedure for piece dyeing blends of Zefran acrylic and wool employing direct and acid dyestuffs in the presence of Albatex HW.

ZEFRAN ACRYLIC FIBER BLENDED WITH CELLULOSIC FIBERS———The dyeing of blends of Zefran acrylic fiber and cellulosic fibers with vat, sulfur and naphthol dyestuffs has been described previously by Burgess (*1, 2*) and Messer

(4). It is shown that union shades, on blends of Zefran acrylic and cellulosic fibers, are obtained with these type dyestuffs employing single-bath procedures. Dyeing cycles are similar to those for 100% cellulosic fibers. Full shades are economically obtained with these classes of dyestuffs although temperatures higher than those normally employed for cellulosic fibers are used. The use of Preventol GDC (dihydroxydichlorodiphenylmethane) as a retarding agent for Zefran acrylic in the production of light shades also has been discussed.

The discussion in this paper includes only newer developments in the application of naphthol dyestuffs to blends of Zefran acrylic fiber and cellulosics. It is worthy to review the main differences between the behavior of naphthol dyes when applied to Zefran acrylic and their behavior when applied to cotton. Major differences are:

1) All members of the Naphthol AS series exhibit high substantivity to Zefran acrylic irrespective of their substantivity for cotton.
2) Variations in liquor-to-goods ratio in the impregnation bath have a significantly lesser effect on the exhaustion of naphthols on Zefran acrylic than on cotton, as shown in Figure 5. Herzog, et al (3) reported similar findings.
3) The affinity of naphthols to Zefran acrylic increases with temperatures; maximum affinity is attained at 176°F (3, 4). On the other hand, the affinity of naphthols to cotton decreases as the temperature rises. The generally recommended impregnation temperature is 85°-105°F (5).
4) Zefran acrylic fiber impregnated with naphthols shows no appreciable loss in depth of shade when exposed to prolonged rinsing with cold water. Impregnated cotton exposed to a similar wet treatment shows an extremely severe loss in depth of shade.
5) The rate of coupling of naphthols on Zefran acrylic is slower than on cotton; however, full shades are developed in normal dyeing cycles at room temperature.

The technique for union dyeing blends of Zefran acrylic and cotton with naphthol dyes is not complicated despite the differences in the dyeing characteristics of the two fibers.

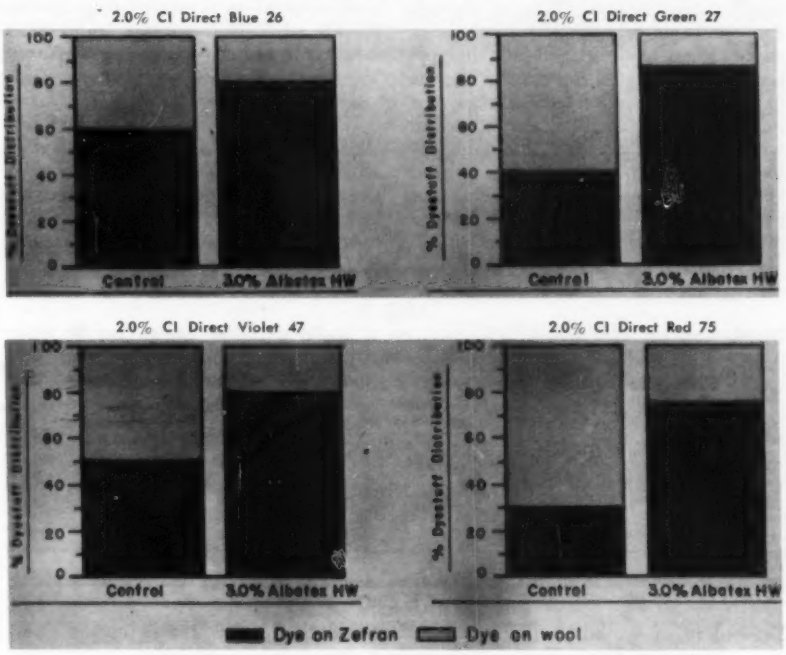

Figure 4
The effect of Albatex HW on the distribution of direct dyestuffs on 50/50 Zefran and wool
(Dyed at a boil for one hour—pH 4.5-5)

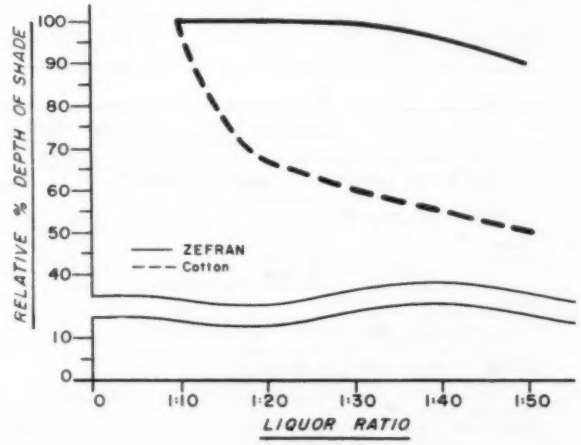

Figure 5
Depth of shade vs liquor ratio—2.0% CI Azoic Coupling Component 7

A wide range of union shades is obtained by proper selection of naphthols and by providing optimum liquor-to-goods ratios and temperature conditions. Generally speaking, naphthols of medium-to-high substantivity to cotton applied at a low liquor-to-goods ratio and at low temperatures will yield the best results. Although maximum exhaustion of naphthols on Zefran acrylic fiber takes place at 176°F, very good yields are also obtained at lower temperatures.

The effect of the naphtholation temperature on the distribution of several napthols between Zefran acrylic and cotton and Zefran acrylic and rayon is shown in Tables III and IV respectively.

Note that union shades on Zefran acrylic and rayon are produced at a slightly higher temperature of naphtholation than on blends of Zefran

acrylic and cotton. This is due to the increased affinity of naphthols to rayon versus cotton. In all the experiments reported herein the depths of shade were determined after the naphtholated materials were coupled with a fast color salt. The heaviest shade obtained in each case is the standard while the others are expressed in percent depth relative to the heaviest shade.

A typical procedure for dyeing blends of Zefran acrylic and cotton with naphthol dyes is shown in Table V.

ZEFRAN ACRYLIC FIBER BLENDED WITH POLYESTER FIBERS——Blends of Zefran acrylic fiber and polyester fibers can be dyed to a wide range of union, tone-on-tone, and cross-dyed shades using vat, naphthol, sulfur, neutral premetallized or aftertreated direct dyes on Zefran acrylic and selected disperse dyes on the polyester.

The dyestuffs recommended for Zefran acrylic fiber produce relatively little stain on the polyester fibers. On the other hand, proper combinations of carrier and disperse dyestuffs are necessary for the polyester component to minimize cross-staining of Zefran acrylic. Cyanatex Dyeing Assistant EM, Tanavol and Carrier DAC-888 have been found to be among the most efficient carriers in this respect (Table VI). Phenylphenol-type carriers should be avoided since they tend to accentuate the staining of Zefran acrylic and, in addition, may act as retarding agents for direct dyestuffs on Zefran acrylic.

Colored-on-white effects are best obtained by dyeing Zefran acrylic and leaving the polyester component undyed.

Blends of Zefran acrylic fiber and polyester fibers may be dyed by any one of the following methods, depending on fastness requirements and availability of equipment.

1) *One-bath Carrier-dyeing Method.* Zefran acrylic is dyed with direct or neutral premetallized dyes and the polyester component is dyed with selected disperse dyes and carrier simultaneously. Generally a dyeing cycle of 1.5 hours at a boil is satisfactory. The addition of salt to exhaust the direct dyes should not be made until the disperse dyes are fairly well exhausted. A typical procedure for dyeing blends of Zefran acrylic and Dacron Type 54 fibers by a single-bath method is illustrated in Table VII.
2) *Two-bath Carrier-dyeing Method.* In this method the polyester portion of the blend is dyed with properly selected disperse dyes and carrier, employing known techniques for carrier-dyeing polyester fibers. The dyeing is followed by a scour with an anionic detergent

TABLE III

Distribution of naphthols (2.0% owf) on a blend of 50% Zefran acrylic fiber and 50% cotton under various temperature conditions. Bath ratio 20:1—45 minutes dyeing time—6.5 g/l sodium chloride.

	Temperature of impregnation and distribution of naphthols between Zefran acrylic and cotton expressed in percent shade build-up							
	105° F		*120° F*		*140° F*		*160° F*	
	Zefran	*Cotton*	*Zefran*	*Cotton*	*Zefran*	*Cotton*	*Zefran*	*Cotton*
CI Azoic Coupling Component 3	30	70	45	55	45	55	55	45
" " " " 7	55	45	55	45	70	30	80	20
" " " " 8	55	45	65	35	70	30	80	20
Naphthol AS-S	50	50	55	45	60	40	70	30
CI Azoic Coupling Component 35	45	55	50	50	55	45	60	40

TABLE IV

Distribution of naphthols (2.0% owf) on a blend of 50% Zefran acrylic fiber and 50% rayon under various temperature conditions. Bath ratio 20:1—45 minutes dyeing time—6.5 g/l sodium chloride.

	Temperature of impregnation and distribution of naphthols between Zefran acrylic and rayon expressed in percent shade build-up							
	105° F		*120° F*		*140° F*		*160° F*	
	Zefran	*Rayon*	*Zefran*	*Rayon*	*Zefran*	*Rayon*	*Zefran*	*Rayon*
CI Azoic Coupling Component 3	25	75	35	65	40	60	45	55
" " " " 7	40	60	50	50	50	50	55	45
" " " " 8	45	55	50	50	50	50	60	40
Naphthol AS-S	45	55	50	50	50	50	60	40
CI Azoic Coupling Component 35	35	65	40	60	55	45	55	45

TABLE V

Typical formulation for package dyeing a blend of 80% Zefran acrylic fiber and 20% cotton with naphthol dyestuffs.

Red

Scour with 1.0% anionic detergent 1.0% TSPP	at 180°—200° F for 30 minutes
Rinse	
Set bath with 3.0% sodium hydroxide 0.5% sequestering agent	at 120° F for 10 minutes
Add 2% CI Azoic Coupling Component 7 (predissolved)	
Raise temperature to 140° F	
Run at 140° F for 10 minutes	
Add 10.0% sodium chloride at 140° F over 10 minutes	
Run at 140° F for 10 minutes	
Drop bath	
Set fresh bath with 20.0% sodium chloride 0.5% sequestering agent 0.5% sodium hydroxide	cold for 10 minutes
Drop bath	
Couple with 6.6% CI Azoic Diazo Component 12 10.0% sodium chloride 1.0% Diazopon SS-837	cold for 45 minutes
Drop bath	
Rinse with warm water for five minutes	
Soap with 2.0% Diazopon SS-837 0.5% sodium carbonate	at 180° F for 10 minutes
Rinse well	

TABLE VI

Effect of various carriers on the staining of Zefran acrylic fiber by selected disperse dyes (AATCC stain ratings).

Disperse dyes applied to Dacron Type 54	*Dowicide A one oz/gal*	*Cyanatex Dyeing Asst EM two oz/gal*	*Tanavol one oz/gal*	*Tanalon one oz/gal*	*Carrier 95 2/3 oz/gal*	*Carrier DAC-888 2/3 oz/gal*	*Carrier CA-RE-DI 0.4 oz/gal*
2.0% Eastman Polyester Navy G	dyed	4.5	4.5	——	4 +	4.5 +	——
1.0% Latyl Cerise N		4 +	4.5	4.5	4 +	4	3
1.0% Latyl Blue 4R	dyed	3.5	5	——	4 +	3	——
1.0% Interchem Polydye Burnt Orange O		3	4.5	4.5 +	3	3	1
2.0% Eastman Polyester Yellow RL	dyed	3.5	4	4 +	3.5	2.5	3

TABLE VII

Typical formulation for piece dyeing a blend of 75% Zefran acrylic fiber and 25% Dacron Type 54 employing a one-bath method.

Navy		
Scour with	1.0% anionic detergent	at 160° F for 30 minutes
Rinse		
Set bath with	5.0% ammonium sulfate	
	1½ oz/gal Cyanatex Dyeing Assistant EM	cold for 10 minutes
Add	4.2% CI Direct Blue 98	
	2.1% CI Direct Blue 171	
	1.4% Eastman Polyester Navy G	
	0.066% Eastman Polyester Yellow RL	
	0.175% Latyl Cerise N	
	0.175% Latyl Brilliant Blue BG	
	2.000% dispersing agent	
Raise temperature to a boil (3° F/min)		
Boil 60 minutes		
Add	40.0% sodium chloride	at a boil over 30 minutes
Cool and rinse		
Aftertreat with	2.6% Gycofix 67	
	0.75% acetic acid	at 160° F for 30 minutes
Cool and rinse		

after which Zefran acrylic is dyed with vat, naphthol or sulfur dyes.

3) *Two-bath Pressure-dyeing Method.* The polyester portion of the blend is dyed first with disperse dyes employing known techniques for pressure-dyeing polyester fibers. Generally, a dyeing cycle of 1.5 hours at 250° F is satisfactory. Following dyeing, the material is scoured with an anionic detergent after which Zefran acrylic fiber is dyed with vat, naphthol or sulfur dyes at normal dyeing temperatures.

The dyeing methods just described apply to the dyeing of Zefran acrylic fiber blended with any of the various polyester fibers commercially available.

WARRANTY

This information, based on our experience and commonly used testing methods, is believed to be accurate; however, no warranty is made and no responsibility is assumed regarding its merits nor is freedom of patent to be inferred. The reader is expected to confirm the information by independent experiments and it is not to be further disseminated without written permission of The Dow Chemical Company.

TRADEMARKS

Albatex—Ciba Co, Inc
Capracyl—E I duPont de Nemours & Co, Inc
Carrier 95—Cindet Chemicals, Inc
Carrier DAC-888—Cindet Chemicals, Inc
Carrier CA-RE-DI—Cindet Chemicals, Inc
Cyanatex—American Cyanamid Co
Dacron—E I duPont de Nemours & Co, Inc
Diazopon—Antara Chemicals, Division of General Aniline & Film Corp
Dowicide—The Dow Chemical Co
Eastman Polyester—Eastman Chemical Products, Inc
Gycofix—Geigy Dyestuffs
Hostalan—Carbic Hoechst Corp
Interchem Polydye—Interchemical Corp
Isolan—Verona Dyestuffs
Latyl—E I duPont de Nemours & Co, Inc
Lupomin—Jacques Wolf & Co
Preventol—General Dyestuff Co
Pyrazol—Sandoz, Inc
Supralan—General Dyestuff Co
Tanalon—Tanatex Chemical Corp
Tanavol—Tanatex Chemical Corp
Zefran—The Dow Chemical Co

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(1) Burgess, R L, "Package Dyeing Blended Yarns of 80% Zefran and 20% Cotton or Rayon," *Am Dyestuff Reptr 48*, No. 10, 35-7 (1959).

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(3) Herzog, H, and Koszticza, J "Farbeversuche Mit Naphthanilid—Farbstoffen Auf Zefran—Polyacrylnitrilfasern," *SVF-Fachorgan 14*, 195-204 (1959).

(4) Messer, A S, "Dyeing of Zefran and Blends Containing Zefran," *Am Dyestuff Reptr 47*, P84-92 (1958).

(5) "Manual for the Dyeing with Naphthol AS Products," HOE2275e, Carbic Hoechst Corp, Mountainside, NJ.

AATCC Calendar

COUNCIL; NATIONAL COMMITTEES
Sept 26 (Statler Hotel, Buffalo, NY); Council (8 PM)
Oct 27 (Sheraton Hotel, Philadelphia, Pa); TCR, research and administrative committees
Nov 17 (Hotel Sherman, Chicago, Ill); Council and Annual Meeting (2 PM)
Jan 26 (Hotel Commodore, New York, NY); Council (10 AM)
Apr 13 (Francis Marion Hotel, Charleston, SC); Council, administrative and research committees

NATIONAL CONVENTIONS
Sept 27-29, 1961 (Hotel Statler, Buffalo, NY); 1962 (Atlanta Biltmore Hotel, Atlanta, Ga); 1963—Boston; 1964—New York; 1965 (Conrad Hilton Hotel, Chicago, Ill); 1966 (Philadelphia, Pa)

DELAWARE VALLEY SECTION
Sept 15 (Wilmington, Del); Oct 27, Dec 1 (Beck's Restaurant, Philadelphia, Pa)

HUDSON-MOHAWK SECTION
June 23 (Outing—Antlers Club, Amsterdam, NY)

METROPOLITAN SECTION
June 9 (Annual Outing—North Jersey Country Club, Wayne Township, NJ)

MID-WEST SECTION
June 24 (Annual Outing—Cerami's Island View Resort, Burlington, Wis); Nov 18 (Chicago, Ill)

NORTHERN NEW ENGLAND SECTION
Sept 8 (Annual Outing); Oct 20 (Quartermaster R & E Command, Natick, Mass); Dec 18 (Motel 128, Dedham, Mass); Jan 19 (Woodlawn Country Club, Newton, Mass)

PACIFIC NORTHWEST SECTION
Aug 5 (annual outing); Nov 10 (business meeting)

PACIFIC SOUTHWEST SECTION
Sept 30 (outing), Nov 17

PALMETTO SECTION
June 8-10 (joint outing with Piedmont Section at Grove Park Inn, Asheville, NC); Sept 15-16 (Clemson House, Clemson, SC); Jan 20-21 (Poinsett Hotel, Greenville, SC); April 14-15, 1962 (Francis Marion Hotel, Charleston, SC)

PIEDMONT SECTION
June 9-10 (Outing, Grove Park Inn, Asheville, NC); Sept 23 (Hotel Barringer, Charlotte, NC)

RHODE ISLAND SECTION
June 23 (Outing); Sept 15 (Management Meeting); Oct 17 (Dinner Meeting); Dec 1 (Annual Business Meeting)

SOUTH CENTRAL SECTION
June 16-17 (Summer Outing—Riverside Hotel); Sept (Hotel Patten—tentative)

SOUTHEASTERN SECTION
June 9-10 (Summer Outing, Radium Springs, Albany, Ga); Sept 9 (Ida Cason Gardens, Pine Mountain, Ga); Nov 25 (Atlanta Athletic Club, Atlanta, Ga)

WESTERN NEW ENGLAND SECTION
June 9 (Annual Outing); Sept 15 (Plant visitation); Oct 27 (Annual Meeting); Dec 1 (Shelton, Conn)

Activities of the Local Sections

Piedmont

PIEDMONT Section held its Spring Meeting, April 22, at the Jack Tar Hotel, Durham, NC with approximately 250 members and guests present.

At the morning session, D W Chaney, executive director, Chemstrand Research Center, Inc, spoke on "Why Chemstrand Chose the North Carolina Research Triangle for the Chemstrand Research Center", following which Joel Lindberg of North Carolina State College discussed "Textile Research for Sales".

The afternoon technical session was highlighted with a paper by C E Colwell and W E Rixon, Union Carbide Chemicals Co, on "Nonionic Surfactants".

A special meeting of some 40 members interested in the dyeing and finishing of hosiery was held with Henry B Dixon, Burlington Hosiery Co, presiding. The group was shown a movie produced by Eugen Bellman GmbH, dealing with the company's automatic hosiery dyeing and boarding machine. Following the showing, Curt Kronsbein and Albert Friedman of the Bellman organization answered questions from the floor.

A temporary committee was formed from the hosiery group to study a proposal that a special technical division be set up in the Northern Piedmont Section for those members interested in the dyeing and finishing of hosiery. The Committee will report on the feasibility of a program and make recommendations as to its scope and activity at the first meeting of the Northern Piedmont Section, which will be held at the Roanoke Hotel, Roanoke, Va, on October 7. The Committee consists of Fred C Davis, Long Finishing Mills, Inc, chairman; William T Simpson, Kayser-Roth Hosiery Co, vice chairman; and Fred C Munday, Marlowe-Van Loan Corp.

Among those attending the Piedmont Section meeting were AATCC President Elliott Morrill and other national officers and Councilors, who were in Durham for national meetings on Friday. The Councilors were treated to a bus tour of the Research Triangle, including NC State College, Univ of North Carolina, and Duke Univ.

The traditional social hour preceded the evening buffet, at which Douglas C "Peahead" Walker, scout for the New York Giants professional football team was guest speaker.

The Piedmont Section's next affair will be its annual Summer Outing, to be held at the Grove Park Inn, Asheville, NC, June 9 and 10.

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Metropolitan

THE Annual Outing and Golf Tournament of the Metropolitan Section will be held on Friday, June 9, at the North Jersey Country Club, Wayne Township, NJ.

Edward G Bobilin, Sandoz, Inc, heads an outing committee consisting of Charles G Germanetti, Vivitone Inc; Eugene J Grady, Jacques Wolf & Co; George A Jonic, American Cyanamid Co; Gerard Heine, Koppers Co, Inc; Richard E Miller, Eastman Chemical Products, Inc; and R P Monsaert Jr, American Felt Co.

One of the highlights of the outing will be a golf match between six-man teams of the Delaware Valley and Metropolitan Sections.

•

Southeastern

THE 12th annual outing of the Southeastern Section, to be held at Radium Springs, Ga, June 8-10, has been designated the Civil War Centennial Outing.

It is reported that the Friday night entertainment will be conducted by a South Carolina swamp fox along with a wild and wooly collection of assorted rebels and carpetbaggers. Genuine Confederate money will be issued to all registrants and sundry means will be provided to make it grow.

A full program of golfing, trap shooting, fly casting and horseshoes is scheduled, as is a special program for the ladies.

General chairman for the outing is Frank H Cooper, Dixie Belle Mills, Inc. General cochairman is David Meriwether, Seydel-Wooley & Co.

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Rhode Island

THE 1961 Outing Committee of the Rhode Island Section met April 27 at Metacomet Golf Club, East Providence, RI, to finalize plans for the Section's annual outing, which will be held June 23 at the Metacomet.

Members of the Committee are Everett W Counsell, Interchemical Corp, chairman; Daniel V Capuano, Crown Chemical Corp, assistant chairman and tickets; James G Falcon, A Harrison & Co, donations; Walter E Murray, Crown Chemical Corp, dining and advisory; Richard V Dugdale, Rohm & Haas Co, printing; James A Davies, Arnold, Hoffman & Co, Inc, golf; Kenneth C Everett, photography; Kenneth J Broden, The Sherwin-Williams Co, publicity; and Harold Rogers, Owens-Corning Fiberglas Corp, golf assistant and gifts.

1961 OUTING COMMITTEE—RHODE ISLAND SECTION—Seated, l to r: Harold Rogers, golf assistant and gifts; Everett W Counsell, chairman; Daniel V Capuano, assistant chairman and tickets. Standing, l to r: James A Davies, golf; Walter E Murray, dining and advisory; James G Falcon, donations; and Kenneth C Everett, photography.

Membership Applications

CENTRAL ATLANTIC REGION

Delaware Valley Section

Senior

Arthur O Contag—Chemist, Dept of Biochem & Nutrition, Grad School Pub Health, Pittsburgh, Pa. Sponsors: E Artim, P J Fynn.

Henry J Hackstie—Lab technician, Textile Service Co, Philadelphia, Pa. Sponsors: J E Conway, G H Detwiler.

Associate

Robert D Clarke—Market mgr, textile industry, Minneapolis-Honeywell Regulator Co, Philadelphia, Pa.

Metropolitan Section

Senior

James D Barnhurst—Industrial chemist, Colgate Palmolive Co, Jersey City, NJ. Sponsors: H Ehrhardt, W B Mihalik.

Hudson-Mohawk Section

Associate

Gordon R Gill—Industrial sales rep, Morton Salt Co, New York, NY.

Niagara Frontier Section

Senior

Karol L Geyer—Dyer, Harding Carpets Ltd, Guelph, Ontario, Canada. Sponsors: N J Mohoruk, H F Parkinson.

SOUTHERN REGION

Palmetto Section

Senior

Donel T Kelley—Asst foreman, dye dept, Kendall Co, Bethune, SC. Sponsors: F B Wobecky, C S Hughey.

Junior

Max T Hyde — Technical engr, Deering Milliken Research Corp, Spartanburg, SC. Sponsors: W P Walker Jr, R O Hope.

Piedmont Section

Junior

Joseph C Eaddy Jr—Asst chemist, J P Stevens & Co Inc, (Carter Fabrics) Wallace, NC. Sponsors: L Hurley, R A Fields.

Southeastern Section

Senior

William B Amos Jr—Salesman, Wica Chemicals, Inc, Charlotte, NC. Sponsors: W B Amos, J C Boesch.

Milton H Haynes—Supv in dyeing, Coats & Clark Inc, Albany. Ga. Sponsors: R B Hallowell, C Q Wright Jr.

Junior

Reginald A Fujimoto—Chemist, U S Dept of Agriculture, Southern Regional Research Lab, New Orleans, La. Sponsors: T W Fenner, R M Reinhardt.

Transfer to Senior

James O Hammond—Technical dev engr (textiles), The William Carter Co, Barnesville, Ga. Sponsors: N S Dunten, J U Little.

Transfer to Junior

Arthur W Davis—Chemist, Coats & Clark Inc, Albany, Ga. Sponsors: R B Hallowell, C Q Wright Jr.

WESTERN REGION

Mid-West Section

Senior

Walter A Schroeder—Project leader, Nalco Chemical Co, Chicago, Ill. Sponsors: A J Andrews, F S Stover.

STUDENT CHAPTER
Lowell Technological Institute

Student

Takayuki Murayama — Graduate student of tex engr, Lowell Technological Inst, Lowell, Mass.

AT LARGE

Senior

Claude G Lemire—Dyehouse supt, Society Textiles, Franco-Canadian, Montreal, Quebec, Canada. Sponsors: N G Koehler, J R Stewart.

John B Villeneuve—Sales rep, Geigy Chemical Corp, Dyestuff Div, Town of Mount Royal, Montreal, Canada. Sponsors: N G Koehler, J R Stewart.

Martin W Schwemmer—Research mgr, Triatex Inc, Textile research & dev, Zurich, Switzerland. Sponsors: A E Lauchenauer, W Kunz.

Elected to Membership

May 17, 1961

No designation after name indicates Senior
(A) indicates Associate
(J) indicates Junior
(S) indicates Student
*indicates transfer from another class of membership

NEW ENGLAND REGION

Rhode Island Section

Alanson W Bowden Jr
Aloysius J Gabriel
Ralph A Guerriero
Carl W Hedberg
Arthur Pickering
Carl H Stetson Jr
Lucien A Tetreault
Emerson E Vanasse
Peter J Winters
Ralph J Guerriero Jr (J)

CENTRAL ATLANTIC SECTION

Metropolitan Section

Emre Bleier
Johannes R Hohl
Dominic L Verillo
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SOUTHERN REGION

Palmetto Section

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William H Miller

Piedmont Section

Kenneth C Copeland
David D Corn
Edwin J Greene
William T Nescot
John W Thompson Jr

South Central Section

Jacques C Van Audenhove
Hawain E Underwood

Southeastern Section

Ralph M Persell
Andrew G Pierce Jr (J)

Washington Section

Samuel Shapiro

WESTERN REGION

Mid-West Section

Thomas T Kenmotsu (A)

STUDENT CHAPTERS

Georgia Institute of Technology

J Robert Ritter
Thomas S Roberts

New Bedford Institute of Technology

Peter F DeCosta
Foroz Nazaheri

AT LARGE

Ernest G Schmidt

AATCC EMBLEMS

YOUR membership lapel emblems, pins and tie clips are badges of distinction. Do you wear them at section meetings, national conventions, on business and social occasions?

Lapel emblems are available at $2.25 and pins at $2.50. AATCC emblem tie clasps (gold), specially boxed for gift presentation, sell for $4.00 each. All are available through National Headquarters, Box 28, Lowell, Mass.

COLOUR INDEX HUE INDICATION CHARTS AVAILABLE FROM NATIONAL HEADQUARTERS

Copies of the *Colour Index* Hue Indication Chart are now available from National Headquarters at a price of $1.50 per copy.

The most important property of any coloring matter is its hue on a given substrate. The coloring matters in each usage section of Part I of the *Colour Index* have therefore been subdivided into a regular series of hue groups for which the conventional descriptions yellow, orange, red, violet, blue, green, brown and black (with the addition of white in the section devoted to pigments) have been adopted. This classification has been incorporated in the system of serial usage numbers in Part I. Each entry carries a reference number, eg, CI Acid Yellow 1 or CI Vat Blue 20; these numbers are consecutive within each hue group and will be extended as supplementary volumes appear. The commercial name under which a coloring matter is marketed does not necessarily give a precise indication of its hue. This is well illustrated by the wide divergence which frequently occurs in the commercial names used by different manufacturers for the same coloring matter. To overcome these inconsistencies and to introduce some measure of standardization a *Hue Indication Chart* was devised. This chart, in the shape of a hexagon, gives prominence to the six major divisions of alternate primary and secondary hues and at the same time provides continuity. Each side of the hexagon is divided into three parts, eg, the yellows are divided into greenish yellow, yellow and reddish yellow. The tertiary hues are placed inside the area of the primary and secondary hues and in association with the parent hues. A neutral grey occupies the center of the hexagon with four radial grey patterns forming a link with the other tertiary hues. Special provision has been made for pinks which are placed adjacent to the reds but outside the hexagon. Cooperating dye and pigment manufacturers were asked to describe the hue of each of their products in accordance with this hue Indication Chart, which is contained in a pocket in Volume 4. In the Chart there is an outline diagram which records the formal descriptions associated with the individual chromatic areas. Each chromatic area is designated by an outline which functions as a line of demarcation between the different areas. Many of the chromatic areas are qualified by the terms bright and dull.

This Chart enables a reader to translate into visual terms the verbal descriptions of hue given in the *Colour Index*.

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Orders in the United States, Mexico, Central and South America (excluding British possessions) should be placed with—

American Association of Textile Chemists and Colorists
PO Box 28, Lowell, Massachusetts

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19 Piccadilly, Bradford, Yorks, England

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It is presumed that authors in studying the comments of reviewers and of the Editor will remember that all recommendations are made in a kindly, helpful, sympathetic manner to improve the paper in both literary and technical excellence. Although authors should cheerfully consider suggestions, they are expected to defend their position if justified, especially when strictly technical matters are involved with which the authors have an intimate knowledge.

AATCC strives to maintain a high scientific and professional standard for papers. Authors must make every effort to avoid the use of trade names, commercial products or process names wherever such use may be construed as advertising. Wherever possible, scientific nomenclature must be employed eg, *Colour Index* designations for dyestuffs and pigments in place of the trade names. It is recognized that in some instances trade names are necessary to avoid lengthy description. Certain trade names have been so widely used as to become generic and these normally are permissable. Further, some technical papers may involve the presentation of a new product or process wherein trade name reference is obligatory.

Giving due consideration to such valid exceptions, it is incumbent upon the author to maintain the proper scientific attitude, avoiding any expressions or devices aimed at promoting a particular product or process.

Questionable papers are to be referred to the chairman of the Publications Committee, who will submit them to an editorial board which would be appointed as needed. The Board would report to the Publications Committee, which would have the final voice in accepting or rejectin a paper.

MANUSCRIPTS — Manuscripts shall be typewritten double-spaced with approximately one-inch margins on 8.5x11-inch white paper. In addition to the *original*, at least one carbon copy is required. Pages are to be numbered consecutively with Arabic numerals, and each page after the first shall carry the authorship at the very top. Tables and figures shall also be numbered consecutively, the tables with headings containing Roman numerals as TABLE I, TABLE II, etc, and the figures with Arabic numerals as Figure 1, Figure 2, etc, appearing *below* the figures. The names of the authors and their laboratories or business connections should appear below the title of the paper.

LITERARY STYLE AND FORM OF PRESENTATION—In the writing of papers, authors are requested to observe a trenchant, simple style of writing directed to textile chemists and colorists with at least an elementary knowledge of chemistry, physics, mathematics, engineering, textile processes and textile machinery.

In the organization of the material, there should be one or more introductory paragraphs setting forth the occasion, significance and main objectives of the paper and of the method of attack. This should be followed by the body of the presentation, either with discussions interspersed throughout this portion or with a collected section marked "DISCUSSION" after the main body of the paper. Finally, there may be a brief section at the end entitled "SUMMARY" or "CONCLUSIONS."

Center and side headings make for easier reading. Center headings should be employed sparingly and generally will include only very important section headings, such as "INTRODUCTION," "EXPERIMENTAL," "DISCUSSION," "CONCLUSIONS," "SUMMARY," and "REFERENCES." Side headings (see sixth paragraph of this *Notice* for an example) shall be indented and run into the text to which they apply, and shall be separated from the paragraph by a dash. The publisher will print center headings in bold-face capitals and side headings in capitals.

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The spelling and rules of punctuation followed in manuscripts shall be those found in the "Merriam-Webster New International Dictionary"; abbreviations and chemical formulas shall conform to *Chemical Abstracts*.

FIGURE AND GRAPHS—Figures and graphs should be black line drawings on white drawing paper. Photographic prints are acceptable, preferably glossy prints on double-weight paper. Duplicates should be available for dispatch to reviewers. In graphs the frame and actual curves should be inked more heavily than the coordinate lines, and these latter should not be too close together. Various styles of broken lines are sometimes desirable to distinguish curves. Experimental points should be given with small plane figures, such as circles, squares, diamonds, or triangles. Numbers and legends on co-ordinate axes are to be lettered in the graph by the author. Number and titles of figures should be placed below the diagram or on the edge of the back. Each piece of illustration copy should bear on the margin or on the edge of the back the name of the author and the title of the paper.

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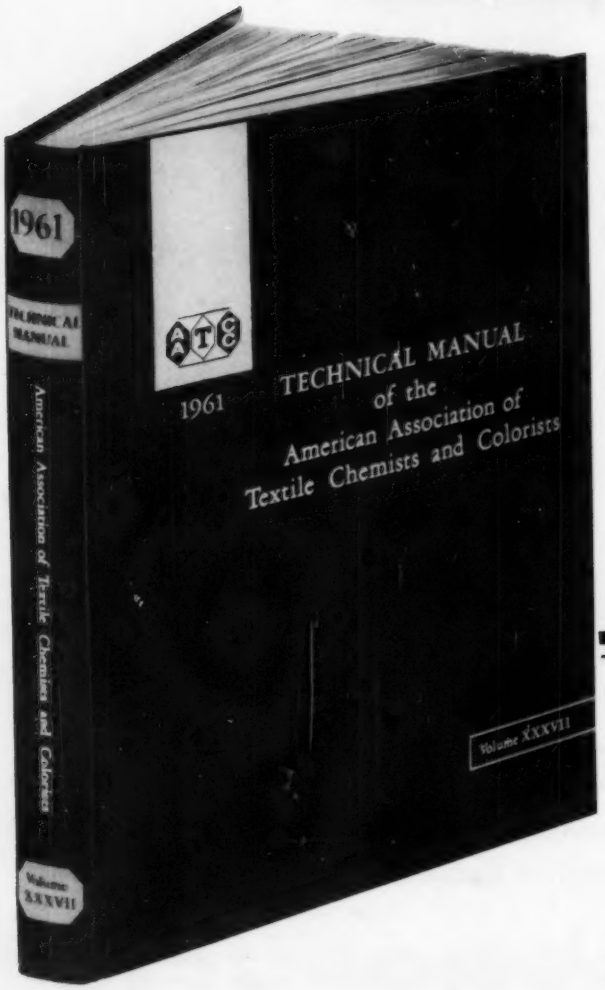

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ADR News Report:

General News of the Industry
Personalities in the News
New Products, Developments, Processes

Bonnar to Head VDI

At the fourth Annual Meeting of the Vat Dye Institute, held April 27th at the Seaview Country Club, Absecon, NJ, J Robert Bonnar, manager of marketing for the Dyestuff and Chemical Division of General Aniline & Film Corp, was elected president to serve during the coming year. Other officers elected were Keith R J Horner of the Toms River-Cincinnati Chemical Corp, senior vice president; Eric R Herbertson, Arnold, Hoffman & Co, Inc, vice president; James L Naylor, American Cyanamid Co, treasurer. E S Meyers of Laporte & Meyers continues as secretary and counsel. Directors elected were W A Bours III of the Organic Chemicals Dept, E I duPont de Nemours & Co, Inc; Neal M Draper of National Aniline Div, Allied Chemical Corp; T C Keeling, Koppers Co, Inc; Edward M Lynch Jr, Chemical Mfg Co, Inc, and Mr Bonnar.

The Promotion Committee will be made up of Mr Bours, chairman; Mr Draper, Mr Keeling and Hans L Urban of Verona-Pharma Chemical Corp. William A Holst of National Aniline Div, Allied Chemical Corp will head the Technical Committee and J L Naylor the Finance Committee.

In reporting to the Institute on the work of the past year, Mr Naylor, as retiring president, said that although the dyestuff industry along with other business had been affected by the recession, the industry had more than kept pace with the economy. He pointed out that the Institute was unique among trade associations in that the members themselves provide the required leadership and execute the programs.

"The past year saw a shift in the emphasis of the work of the Institute" said Mr Naylor. "Instead of promoting vats, the Institute has provided information to the entire textile industry on the relative suitability of dyes and colors for specific types of merchandise."

Mr Bours, in his report on the work of the Promotion Committee during the past year, also emphasized the position of the Institute as a service organization for the textile industry.

●

New Market Development Prices for Polymethylbenzenes

New market development prices for two polymethylbenzenes have been established by Enjay Chemical Co.

Pseudocumene (1,2,4-trimethylbenzene) is available in carload-drum quantities at 13 cents per pound; the new less-than-carload-drum price is 14½ cents per pound.

Durene (1,2,4,5-tetramethylbenzene) is now offered in development quantities at the less-than-carload-drum price of 49 cents per pound.

Suggested outlets for pseudocumene include preparation of intermediates for oil-soluble and water-soluble alkyd resins, polyesters, plasticizers, fibers and films and as a raw material for dyes, according to Lawrence T Eby, assistant director of market development for Enjay. Durene is also proposed as an intermediate in the manufacture of fibers, films, plastics, dyes and protective coatings.

Enjay, a Division of Humble Oil & Refining Company, is a supplier of such other products as: olefins, alcohols, oxo alcohols, ketones, ethers, esters, aromatics and other chemicals to industry; Escon polypropylene; Buton resins for paints and plastics; Enjay Butyl rubber; Paramin additives for fuels and lubricants.

For further information, write to Enjay Chemical Co, Room 1131, 15 West 51st St, New York 19, NY.

●

Macbeth Appoints Hazard Advertising

Macbeth Corp, Newburgh, NY, and its subsidiaries have appointed Hazard Advertising Co, Inc as their advertising agency.

The Macbeth organization, started in 1915, is devoted to the manufacture and sale of scientific daylighting equipment for visual color matching and color evaluation and scientific electronic and optical instruments for the measurement of color and light.

Ansul, Continental Oil to Construct Methyl Chloride Plant at Lake Charles

Plans to construct a petrochemical plant at Lake Charles, La, to produce annually some 60,000,000 pounds of methyl chloride for use in a variety of chemical products, were announced jointly on May 20 by Robert C Hood, president of Ansul Chemical Co, Marinette, Wis, and L F McCollum, president of Continental Oil Co, Houston, Tex.

Cost of the new Lake Charles facility, which will be owned 50 percent each by Ansul and Conoco, is in excess of $1,000,000, the announcement stated.

There has been a steady growth in demand in recent years for methyl chloride, which is used in the manufacture of silicones, methyl cellulose and quaternary ammonium compounds.

Work on the plant is expected to start immediately, with completion scheduled for early 1962. Ansul Chemical Co will be the exclusive distributor of the plant's output of methyl chloride.

●

Retail Store Training Sales People Explain NRMA Sure Care Symbols

American retail stores have begun training sales people to explain the new garment and domestic care symbols that will be attached to on-the-shelf products this summer.

Macy's New York set the pace for other retail stores with the first in-store training program for selling personnel on the Sure Care Symbols developed and promoted by the National Retail Merchants Association. The Macy's training course was announced April 10 by Herbert Mines, training director, Macy's.

Those companies already imprinting the NRMA Sure Care Symbols on their products reportedly are: Bates Manufacturing Co, New York, makers of bedspreads; Dan River Mills, New York, manufacturers of sheets and pillowcases; Charles Pindyck, Inc, New York, manufacturers of infants wear; Shelbourne Shirt Co, New York, manufacturers of men's sport and dress shirts; and Eagle Shirtmakers, New York, manufacturers of men's shirts.

The NRMA Sure Care Symbols are designed to provide consumers with a quick and simple reference, permanently affixed to a garment or other textile product, on whether and how to wash, iron or dryclean an item. These symbols were developed by the NRMA Technical Committee under the direction of Ephraim Freedman, committee chairman and director of Macy's Bureau of Standards. Other retail stores desiring large quantities of the NRMA Sure Care Symbols Charts for similar in-store training program can obtain them at the nominal cost of $1.00 per hundred by writing Robert Gur-Arie, public relations director, National Retail Merchants Association, 100 West 31st St, New York 1, NY.

●

Ciba Sales in US Total $78 Million

Ciba earnings of $6.7 million on world-wide sales in excess of $260 million were announced at the recent annual meeting of the Ciba board of directors in Basle, Switzerland.

U S sales of Ciba dyes, plastics, pigments, pharmaceuticals and other chemical products were $78 million in 1960, second only to the record high of 1959 and almost double the 1951 sales. All of the Ciba companies in this country are wholly owned subsidiaries of Ciba Limited.

Over $20 million was spent in Ciba research centers in Europe and America, a 20 percent increase over the company's 1959 research expenditures.

●

Bodman Chemicals Office Move

Bodman Chemicals, formerly F L Bodman Co, recently completed removal of its offices to 50 East Wynnewood Rd, Wynnewood, Pa. The new telephone is TRinity 8-3477.

Royce Introduces Corobex

Royce Chemical Co, Carlton Hill, NJ, has acquired the processes and manufacturing facilities of the Sintos Company, Inc, which developed Corobex and pioneered in obtaining a broad range of applications for it in products such as clothing, housewares, nursery products, sheeting, toys and paints.

A bacteriostat and fungistat, Corobex is described as "a formulation that can be used with complete safety in product manufacture and provide enduring protection against disease-carrying bacteria, mold growth and mildew as well as perspiration and other odors caused by bacteria decomposition."

Royce Chemical sees a broad market for Corobex for use in products as diversified as vinyl wall coverings, upholstery, bedding clothing of all types, household cleaners, floor waxes, plastic products, detergents, leather goods and lacquers.

Corobex will be marketed by the Royce Chemical sales and distribution organizations under the direction of former Sintos management.

It is at present available as a powder and liquid, and market development plans include the preparation of special formulations to meet the needs of different industries.

Test data and other information may be obtained by writing to the Corobex Div, Royce Chemical Co, Carlton Hill, NJ.

•

Syl-mer Finish in New Laminated Fabrics

Dow Corning Corporation reports increasing demand for its Syl-mer finish on new woven and knitted fabrics laminated to urethane foam.

The silicone finish reportedly is starred in laminate fabrics by a number of mills to be featured in Fall men's, women's and children's apparel.

Significant among reasons cited for use of the silicone finish is its answer to problems in sewing. Untreated laminated fabrics present difficulties in sewing because of friction on the sewing machines, often causing the fabric to "bunch up." A Syl-mer finish on the fabric is said to permit it to slip easily through the machine. Also, the silicone treatment in effect serves to "lubricate" the machine needle as it passes through the fabric, thereby reducing fiber cutting and material waste, and improving seam efficiency, it is claimed.

Another problem reportedly solved by the Syl-mer finish is water absorption. Polyurethane tends to soak up water in normal garment wear. It is claimed that, with the silicone finish, rain and moisture is repelled, permitting the laminate to retain its lightness.

In addition to durable water repellency, other reasons listed for use of Syl-mer laminates are that it provides spot and stain resistance, and lends fabrics a softer hand.

Among the mills that are said to have introduced laminated fabrics treated with Syl-mer are: Friedman-Gins Corp; Guilford Woolen Fabrics, Inc; Malden Mills; Allen Knitting Mills; Princeton Knitting Mills; Security Mills and J P Stevens & Co, Inc.

•

Pliolites 440 and 460

The introduction and commerical production of two new butadiene-styrene synthetic rubber latices, designed for textile and paper applications, has been announced by the Chemical division of The Goodyear Tire & Rubber Co, Akron, O.

The new materials, Pliolite 440 and Pliolite 460, are recommended for textile and carpet backings, binders for nonwoven fabrics, scrim adhesives for carpets and for saturating and coating applications with paper, according to J E Warner, manager of the coatings department.

Both latices are said to be characterized by low viscosity and modified with carboxylics to provide better overall physical properties and faster, more economical curing. They also contain an antioxidant for better aging qualities.

As a result of the carboxylics in these latices, Warner pointed out, processors can use zinc oxide as well as conventional cures.

Chief differences between the two synthetics is that Pliolite 460 imparts more resinous properties which result in stiffer hand or body in the end product, Warner explained.

The versatile new materials, Warner said, provide compounders a single product which can be applied to several product areas through different compounding techniques.

Avicolor

American Viscose Corporation announced recently that the new trademark, Avicolor, will be used to designate the company's spun-dyed rayon and acetate yarns and fibers, and fabrics made with those fibers. The new name will replace the former designation, Colorspun. The corporation will permit the use of the name, Avicolor, only on those fabrics which meet the company's quality standards of performance.

In making the announcement, George L Storm, vice president and director of sales for the corporation's Fibers Division, emphasized that American Viscose is the only man-made fiber producer which offers a coordinated line of spun-dyed colors in rayon staple, rayon filament and acetate filament fibers. "Thus," he said, "the weaver can achieve a wide range of constructions and still qualify for the designation '100 percent Avicolor.'"

With the introduction of Avicolor, American Viscose is enlarging its program of spun-dyed yarns and fibers. Not only has the number of basic colors been expanded but, through the blending of colored yarn staple fibers, a large library of shades and hues is now available for selective color styling.

•

Hartford Fibres Appoints Chirurg & Cairns

The Hartford Fibres Division of Bigelow-Sanford, Inc has appointed Chirurg & Cairns, Inc to handle the advertising and publicity for its new Zantrel Polynosic fiber.

Zantrel is a new cellulosic textile staple fiber which is said to be similar to mercerized combed cotton in its physical and processing characteristics. Hartford Fibres is now in production, and a broad fabric development program has been instituted with mills weaving cotton goods and synthetic fabrics.

•

Harriet-Henderson Mills Sets Up Two Scholarships at NC State

Harriet-Henderson Mills of Henderson, NC, has established two scholarships, valued at $2,000 each for four years of study, in the School of Textiles at North Carolina State College.

The awards, each of which will provide $500 a year for each recipient, will be presented to winning contestants from the North Carolina counties of Granville, Warren, Franklin, and Vance who wish to enroll in the School of Textiles.

•

USIA Producing Film at Land-Grant Colleges

The U S Information Agency is producing a 30-minute motion picture on ten top-level Land-Grant colleges and universities for showing around the world.

The film will be released to coincide with the observance of the Land-Grant Centennial during the 1961-62 academic year and will tell the story of the unique role of Land-Grant colleges in American higher education.

The narration will be made in 40 languages.

Institutions featured in the motion picture will be North Carolina State College, University of California at Berkeley, the University of Arizona, Colorado State University, Rutgers University, the University of Illinois, Ohio State, Kansas State, Pennsylvania State, and Cornell Universities.

One of the film's longest segments was produced at North Carolina State College, where research and teaching functions of the college's School of Textiles will be shown.

The college's use of its cobalt-60 and radiological laboratories will be depicted.

Filming of the production took place in April. Several landscape scenes around the State College campus were made in addition to the laboratory and classroom scenes in the School of Textiles.

Donald D Hoffman, codirector of the project, visited State College and mapped plans for the filming of the North Carolina State segment of the motion picture.

He conferred at length with Malcolm E Campbell, dean of the School of Textiles; G H Dunlap, director of student activities and placement in the School of Textiles; and Rudolph Pate, director of the College News Bureau and chairman of the Land-Grant Centennial at NC State.

PERSONALITIES IN THE NEWS

Currier

Goldstein

Amos

Richardson

Weatherford

Buffing

Appointment of *Raymond R Currier* to the newly created position of supervisor, textile industry sales, for its chemical division, has been announced by Pittsburgh Plate Glass Co.

In his new capacity, Mr Currier will be responsible for the development of sales of hydrogen peroxide and other chemicals to the textile industry. Mr Currier joined Pittsburgh Plate's chemical division in 1958 as a technical representative for the market development department in Pittsburgh.

●

Wica Chemicals, Inc, Charlotte, NC, has appointed *Oliver J Goldstein* technical area representative, and *W Brock Amos* technical sales representative for Georgia, Alabama and Tennessee.

Mr Goldstein, who has had 17 years of experience in textile chemical production, technical applications and sales, will be based in Spartanburg, SC, and will operate in a technical area consisting of South Carolina, western North Carolina, and specific territories in Georgia.

Mr Amos will be located in Columbus, Ga, and will service the textile industry in Georgia, Alabama, and Tennessee.

●

Edward C Diehl has joined Laurel Soap Mfg Co, Inc, Philadelphia, Pa, and has been assigned to the Pennsylvania and New York territory.

Mr Diehl was recently general manager and plant superintendent at Mid-West Processors, Inc, Libertyville, Ill, and previously had been with Ankokas Dyeing and Finishing Co, Mt Holly, NJ.

●

Jack C Smith, a physicist in the Textiles Section of the National Bureau of Standards, has been awarded the U S Department of Commerce Silver Medal for Meritorious Service. He was cited for "his valuable contributions to the science of textile physics during his service as project leader in the Division of Organic and Fibrous Materials and for highly distinguished authorship."

Since joining the Bureau in 1954, Dr Smith has supervised research on the response of textile yarns to impacts at velocities ranging between 10 and 1000 feet per second, as well as in the measurement of wave propagation velocities, specific breaking energies, and critical impact velocities. In addition to obtaining stress-strain data at very high rates of straining, his research has been concerned with rheological and dynamic mechanical properties of textile yarns, and on properties of electrostatically charged textile fibers.

Dr Smith was issued a patent (assigned to duPont) on a process for spinning Teflon monofilaments. He is the author of numerous scientific papers and technical reports.

●

Effective April 1, *Gayle Rogers* was named Southern District sales manager in the Dyestuffs Department of the Chemicals and Dyestuffs Division, Koppers Co, Inc.

Mr Rogers will assume responsibility for dyestuffs in all southern states including Dyestuffs Department branch operations in Chattanooga, Tenn, and Columbus, Ga. Headquarters for the Southern District are at 1500 North Graham St, Charlotte, NC. In his new capacity, Mr Rogers succeeds *J Harvey Orr*, who is nearing retirement.

Mr Rogers joined American Aniline Products in 1949, before its acquisition by Koppers in 1955. Subsequently, he worked as a salesman in several southern territories.

Richard C Richardson of Concord, NC, has been named North Carolina technical representative of Moretex Chemical Products, Inc.

Mr Richardson has been technical superintendent of Kerr Bleachery in Concord for the past 5½ years. He has also served in various technical capacities with Erwin Mills, Cone Mills, and United States Finishing Co.

●

A Stuart MacArthur of Wagon Mound, NM, has been elected vice president, and *Fred Fowles*, of Doylestown, Pa, treasurer of Woolens and Worsteds of America.

In addition to new officers, vacancies on the WAWA board were filled by *Henry Hibbard* of Helena Mont; *T A Kincaid* of Ozona, Tex; and *P Loring Reed Jr* of Lawrence, Mass.

●

J A Weatherford had been promoted to the newly created position of director of sales for Virginia Chemicals & Smelting Co. In his new position, Mr Weatherford will be responsible for all sales of the Company, including industrial chemicals.

Prior to joining the Virginia Chemicals staff in 1954 as manager of its Chemical Sales Department, Mr Weatherford gained experience in laboratory, production, product development, sales and sales management work while associated with the Chemical Division of Goodyear Tire and Rubber Company and the Semet-Solvay Division of Allied Chemical Corporation.

Mr Weatherford will work from the Company's executive headquarters in West Norfolk, Va.

●

William C Buffing Jr, treasurer of National Starch and Chemical Corp, has been elected a vice president. Maintaining his headquarters at National's executive office in New York, he will continue to serve as treasurer of the company.

●

Joseph E Quinty, Chicago sales representative of Emery Industries, Inc, has been appointed assistant sales manager of Emery's Organic Chemical Division and will move to the firm's home office in Cincinnati, O.

Mr Quinty, who has been head of Emery's Chicago office for the past four years, will assist sales manager *James W Ritz*.

Sales representatives *Leslie R Graham* and *Robert H Strawbridge* have been assigned to Emery's Chicago office from the Cincinnati headquarters. This fills the vacancy left by Mr Quinty and also expands the Chicago staff.

Sales representative *Thomas A Williams* has been assigned to Emery's Philadelphia territory to replace *J P Clancy*. Mr Williams has been participating in Emery's sales training program for the past year.

Lindsay C Taliaferro Jr has been assigned to Emery's New Jersey sales territory. He will replace *R S Haley*, who has been promoted to sales manager of Emery's Vopcolene Division on the West Coast.

Two appointments to the Organic Chemicals Division technical staff have been announced. *Kenneth H Pettengill* has been named manager of the Process Research Section, and *Herbert M Kay* has been appointed a product development representative for the Development-Service Department. Mr Kay is engaged in market development for new plasticizers. He comes to Emery from the position of technical service engineer at Celanese Corp.

Carasik

Ultra Chemicals Works, Inc, a subsidiary of Witco Chemical Co, Inc, has announced the appointment of *William Carasik* as technical director.

In his new post, Mr Carasik is responsible for Ultra's technical services, quality control, and plant process engineering.

He joined Ultra in June 1960, and before then was a group supervisor in development engineering for The Atlantic Refining Co, Inc.

●

Johan Bjorksten, president, Bjorksten Research Foundation, Madison, Wis, is the new president of The American Institute of Chemists, it was announced at the 38th Annual Meeting of the Institute, held Friday afternoon, May 12, at the Statler-Hilton Hotel, Washington, DC. Dr Bjorksten succeeds *Milton Harris*, vice president of the Gillette Company, Boston, Mass, who served as president of the Institute during the fiscal year just completed.

In addition to the change in presidents, the following new officers were announced as elected by mail ballot of the membership:

President-elect (to succeed the president in May 1962); *C Harold Fisher*, director, Southern Utilization Research & Development Division, ARS, US Department of Agriculture, New Orleans, La.

Councilors-at-large (to serve for three years): *Henry B Hass*, consultant; *Lloyd H Reyerson*, professor of physical chemistry, Univ of Minnesota (re-elected); and *Martin B Williams*, Army Rocket & Guided Missile Agency, Redstone Arsenal, Ala.

●

Hoechst Chemical Corp, West Warwick, RI, has announced the following appointments:

Alfred Guenther, vice-president; *Johannes Wenghoefer*, vice president; *Genevieve Michalec*, assistant secretary.

●

John De Kalb of Carrollton, Ga, has been added to the staff of the Woonsocket Color & Chemical Co as technician and salesman in the Southern territory.

Gordon Wallace of Anniston, Ala, has left Woonsocket's employ.

●

Newman H Giragosian has joined the Commercial Development Department of The Chemical Group, General Aniline & Film Corp, as senior market research engineer in the Business Research Section.

Mr Giragosian joined GAF from Shell Chemical Co, with whom he had been for ten years in various assignments. His most recent position was that of technologist in the Market Analysis Department of the Industrial Chemicals Division.

●

Carbic-Hoechst Corp, Mountainside, NJ, has announced the appointment of *Harry F O'Connor* as sales representative for pigments. He will be in charge of the newly opened sales office in The Agents Building, 3535 Lee Rd, Cleveland 20, O.

Mr O'Connor, who joined Carbic-Hoechst in 1959 as sales and service engineer in the West Warwick, RI plant, has had more than twenty years of experience in research development production and sales of paint, printing ink, plastics, rubber and organic pigments.

●

The Chemical Division of International Latex Corp has announced the appointment of *Henry R Hutt* as Southern regional sales manager, with offices located in Atlanta, Ga.

Mr Hutt's responsibilities with International Latex Corp will include the sales of Tylac latices to the textile, paper, paint and adhesive industries in the states of Georgia, Tennessee, North Carolina, South Carolina, Florida and Alabama.

Mr Hutt was most recently associated with Wica Chemicals, Inc as a sales engineer.

New officers have been elected by the Textile Technical Federation of Canada, a 1,200-member co-ordinating body of Canada's eight textile technical associations.

Elected president was *A H Miller*, Scholler Brothers Ltd. He replaces *L J Sheps*, Trilon Chemicals, Ltd.

Named vice presidents were *S H Chambers*, The Montreal Cottons Ltd, and *J M Nodtvedt*, of Chemcell Fibres Ltd.

Secretary-treasurer is *George Marshall*, Courtaulds (Canada) Ltd, while directors for the coming season are: *G C Tattersfield*, Ayers Ltd; *C V Grantham*, retired; *Colin H Bayley*, National Research Council; and *R D Bennett*, Du Pont of Canada Ltd.

●

Vernon L Wilkinson has been named sales engineer of B F Perkins & Son, Holyoke, Mass, producer of textile finishing equipment. Wilkinson was associated for 12 years with Rodney Hunt Machine Co, Orange, Mass, where he served as field service engineer, laboratory and patent supervisor and finally as sales engineer. He was serving as new products manager of Curtis & Marble Machine Co, Worcester, Mass, prior to joining Perkins.

OBITUARY

JOSEPH F SULLIVAN, for many years advertising manager of Brown Instruments division of Minneapolis-Honeywell Regulator Co, died April 24 of a heart attack. He was 63 years old.

At the time of his death he was advertising production manager of Honeywell's Industrial Products group.

In 1938 he launched an industrial calendar that became an immensely popular promotion. Its annual series of 12 satirical cartoons gained world-wide recognition.

Mr Sullivan also founded *Instrumentation*, a company-sponsored quarterly publication dealing with various aspects of industrial process instrumentation and systems.

He joined Brown Instruments Company as advertising manager in 1928 and continued in this post after its acquisition by Honeywell in 1934. He was made advertising production manager in 1955.

GENERAL CALENDAR OF COMING EVENTS

ACHEMA
June 9-17 (13th International Chemical Engineering Exposition and Congress——Frankfurt am Main, Germany)

AMERICAN HOME ECONOMICS ASSOCIATION
June 27-30 (52nd Annual Meeting——Cleveland, Ohio)

CHICAGO SECTION, AMERICAN CHEMICAL SOCIETY
Sept 5-8 (11th National Chemical Exposition——Chicago Amphitheatre, Chicago, Ill)

INTERNATIONAL TEXTILE MACHINERY EXPOSITION
Sept 1962 (3rd Exposition, Hanover, Germany)

NATIONAL COTTON COUNCIL OF AMERICA
Nov 8-9 (1961 Chemical Finishing Conference——Sheraton Park Hotel, Washington, DC); Oct 3-4, 1962 (1962 Chemical Finishing Conference——Sheraton Park Hotel, Washington, DC)

SCHWEIZERISCHER VEREIN DER CHEMIKER-COLORISTEN
October 12-14 (Symposium on "Permanent Finishing 1961"——Swiss Federal Institute of Technology, Zurich, Switzerland)

SYNTHETIC ORGANIC CHEMICAL MANUFACTURERS ASSOCIATION OF THE UNITED STATES
June 15, Sept 12, Oct 10, Nov 14 (Luncheon Meetings——Palm Terrace Suite Hotel Roosevelt, New York, NY); Dec 7 (Annual Meeting and Dinner——Hotel Roosevelt, New York, NY)

UNION OF PURE AND APPLIED CHEMISTRY
August 6-12 (18th International Congress of Pure and Applied Chemistry——Montreal, Canada)

WORLD CONGRESS FOR MAN-MADE FIBERS
May 15-18, 1962 (2nd World Congress, London, England)

TECHNICAL LITERATURE

(Literature is available from sources listed in italics)

A POSSIBLE APPLICATION OF ORGANIC FIBERS IN HIGH-TEMPERATURE ENVIRONMENT———*M J Coplan and others, Wright Air Development Division, U S Air Force. June 1960. 137 pages. (Order PB 171 020 from OTS, U S Department of Commerce, Washington 25, DC, $2.75)* ———It is taken as a premise that fabrics used in re-entry drag parachutes require typical textile properties up to deployment but that they need not survive in their original chemical state subsequent to deployment provided the decay occasioned by re-entry conditions (heat, active oxygen, irradiation) does not interfere with the deceleration function. The possible utility of linear organic polymers as the principal chemical species in such materials is examined. Details of re-entry environment conditions, as applicable to the problem are developed. Some of the textile qualities required of the parachute fabric up to deployment are reduced to quantitative criteria. Typical organic, metallic and ceramic materials are contrasted and the advantages of the first class are defined. A detailed acount of the principles of the so-called "metamorphic" fiber system is given, and a number of specific thermochemical reaction schemes and polymer systems are proposed.

●

ABBE JAR MILLS AND JARS———*Abbé Engineering Co, 420 Lexington Ave, New York 17, NY*———New Jar Mill and Jar Catalog 83 (16 pages) covers the Company's 1961 line of eight jar mill styles for batch-production processing of wet and dry materials, pilot-plant production and analytical and experimental testing.

These miniature ball or pebble mills are available for batch grinding, pulverizing, blending and mixing, in capacities ranging from small fractional pint jar units to large 60-gallon multiple jar mills. The same grinding media employed in full-production ball and pebble mills reportedly are used in Abbé jar mills.

The eight Abbé jar mill styles are made in a variety of sizes and multiplicity of jars. One mill can produce batches of the same or different materials at the same time, it is claimed.

●

AMERICAN STANDARDS FOR TEXTILES———*30¢ each; American Standards Association, Dept PR 229, 10 East 40th St, New York 16, NY or American Society for Testing Materials, 1916 Race St, Philadelphia 3, Pa*——— Availability of three newly revised American Standards in the textile field covering test methods for woven fabrics, wool and part-wool fabrics and the number of neps in cotton samples has been announced by the American Standards Association.

Developed and published by the American Society for Testing Materials, the revised standards are of value to testing laboratories and textile manufacturers in determining quality of yarns and fabrics.

The revised American Standards include "American Standard General Method of Testing Woven Fabrics (ASTM D39-59), L14.68-1961," "American Standard Methods of Testing and Tolerances for Certain Wool and Part Wool Fabrics (ASTM D462-59), L14.28-1961" and "American Standard Method of Test for Number of Neps in Cotton Samples (ASTM D1446-59T), L14.97-1961."

In American Standard L14.68-1961, general methods of testing apply to the determination of dimensions, weight, construction and load-elongation relations of woven textile fabrics. American Standard L14.28-1961 prescribes methods of testing and tolerances applying to fabrics made wholly or in part of yarn containing wool, but do not apply to blankets, pile fabrics, knitted fabrics, or felts of wool. American Standard L14.97-1961 concerns testing methods for determining the number of neps in cotton samples, and provides a method for selecting a test specimen and the measurement of neps.

●

COMMON CHEMICAL MARKET———*Foster D Snell, Inc, 29 W 15th St, New York 11, NY*———This directory of chemical companies in the European Common Market and Free Trade Association lists the more than six thousand chemical manufacturers and chemical dealers in the thirteen nations comprising these two major world trade blocs.

In addition to an alphabetical listing of the companies by nation, a special feature of the directory is the classification of European chemical companies by Standard Industrial Classification numbers. This classification is combined with a geographical break-down in a separate section of the "Common Chemical Market". It is anticipated that the directory will serve as a standard reference source for those importing or exporting chemicals to Europe and between European countries, and that it will be a valuable instrument to market researchers for the locating of European companies and the determining of these companies' activities. A brief statistical review, with commentary, of the chemical industry of each of the 13 nations is intended to offer special assistance to those new to European marketing problems.

The "Common Chemical Market" will be available for the present only to subscribers to *Chemical Market Abstracts*, and is to be published May 30.

●

DETERIORATION OF TEXTILE MATERIALS BY ULTRAVIOLET LIGHT———*W S Wilcox and others, Wright Air Development Center, U S Air Force. October 1960, 160 pages. (Order PB 171 417 from OTS, U S Department of Commerce, Washington 25, DC, $3)*———The effects of ultraviolet radiation on polyethylene, Teflon, nylon, Mylar, and Acrilan are described. The materials were irradiated in a vacuum and in an inert atmosphere. Deterioration of these materials is faster for irradiation with short wavelength ultraviolet than it is for long wavelength radiation. Deterioration of polyethylene, nylon, Mylar and Acrilan is faster in a nitrogen atmosphere than it is in a vacuum. However, it was shown that Teflon deteriorates faster in a vacuum.

●

DO-61-DRYING OVENS———*The Carl Mayer Corp, 20800 Center Ridge Rd, Cleveland 16, O*———Featured are oven designs and installations adaptable to the textile industry.

●

DU PONT "BAYMAL" COLLOIDAL ALUMINA——— *Industrial and Biochemicals Dept, E I duPont de Nemours & Co, Inc, Wilmington 98, Del*———88-page booklet offers full information on Baymal, including physical and chemical behavior, preparation and handling of colloidal sols and pastes, procedures and laboratory techniques, storage and handling, corrosion, toxicity, and patents.

Of special interest to the finisher will be the section on "Finishes for Textile Fabrics and Yarns" (pages 65-67).

●

FATTY HYDROXAMIC ACIDS———*Woburn Chemical Corp, Harrison, NJ*———This bulletin describes new fatty hydroxamic acids which are now being produced commercially. These are said to be interesting chemical intermediates because they have a reactive OH and NH group as well as a long straight chain fatty group. They reportedly can react with alkalis, metallic ions and acylating agents. Some of the metallic salts are highly colored. On heating they form isocyanates which can be reacted further with alcohols and amines to form urethanes and ureas respectively. The isocyanates form carbamic acids with water.

Industrially, fatty hydroxamic acids may be used for surface-active compounds, pigment dispersants, dyeing aids, detergents, water repellents, chelating agents, etc.

Bulletin covers physical properties, chemical reactions, and commercial possibilities.

●

FIBER 40 (AVRIL RAYON)———*Technical Service Dept, American Viscose Corp, Marcus Hook, Pa*———New technical service bulletin covers characteristics and properties of this new stable rayon product. Included in the brochure are comparison charts and tables relating test lata resulting from textile development projects conducted since the fiber was first announced to the trade last year.

●

GAGLIARDI RESEARCH CORPORATION———*Gagliardi Research Corp, 5454 Post Rd, East Greenwich, RI*——— Illustrated 16-page brochure describes the research and development efforts of Gagliardi Research Corp, which are devoted primarily to the synthesis and development of resins

and polymers for finishes and coatings of fibrous materials. Major industries served include cellulosic and synthetic woven and nonwoven fabrics, paper, leather, wood and glass fibers.

●

INORGANIC FINISHES FOR KNITWEAR OF ORLON ACRYLIC FIBER———*Technical Service Section, Textile Fibers Dept, E I duPont deNemours & Co, Inc Wilmington, Del*———Properties and uses of Baymal and Alon C, two commercial aluminas, are discussed in this four-page bulletin (OR-109).

Sections are devoted to "Effects of Application on Knitwear", "Choice of Alumina", and "Treatment". The section "Treatment" is subdivided into A) Water Used (conditioning, test for sulfate content); B) Dispersion of Alumina; and C) Application (after piece dyeing and during wet finishing).

●

LABORATORY DRYCLEANING MACHINE—*United States Testing Co, 1415 Park Ave, Hoboken, NJ*—Bulletin describes this apparatus which has been developed for investigating colorfastness and dimensional changes in fabrics during drycleaning.

The drycleaning machine can also be used for laboratory-controlled washing of test fabrics, and reportedly meets requirements of ASA, AATCC, and commercial standards. A versatile apparatus, the controlled agitation of tumbling action is said to afford many applications.

●

MULTIMOTION ABRASION PILLING TESTER—*United States Testing Co, Inc, 1415 Park Ave, Hoboken, NJ*—The multimotion abrasion pilling tester was developed to measure the pilling tendency of woven and knitted goods.

It reportedly has found wide acceptance in the textile industry, and has been successfully employed as an abrasion apparatus for a variety of articles. Properties which can be studied with the instrument include shedding tendencies, resistance to abrasion, and shine or gloss tendencies.

●

OPERATING MANUAL FOR SMALLER STORES—*National Retail Merchants Assoc, 100 W 31st St, New York 1, NY, NRMA members $4.25 per vol, $7.25 per set; nonmembers $6.25 per vol $10 per set*—This handbook is composed of two volumes.

Volume One discusses the more important operating procedures and requirements needed for a successful store. Covered are downtown revitalization, parking, insurance, expense management, personnel, customer services, and store security.

Volume Two contains data of interest to smaller store owners wanting to increase the productivity and profitability of their internal operations. Included in this volume are chapters on store planning, modernization and financing, fixtures, housekeeping, alteration room problems, receiving and marking, and gift wrapping.

●

SCHLUMBERGER NMR ANALYZER———*Ridgefield Instrument Group, Schlumberger Corp, Ridgefield, Conn*——— Twelve-page brochure, illustrated with diagrams and charts, discusses the basic principles of nuclear magnetic resonance analysis. It covers a variety of product quality control, process control, and research uses for Wide Line NMR analytical techniques in chemical, textile, and other industries.

Among the Analyzer applications discussed are the following: quantitative elemental analyses, absorbed/adsorbed liquids analyses, solid/liquid analyses, crystallinity and structural determinations, wetting and moisture bonding studies.

●

SURFACTANTS DATA———*Continental Chemical Co, 195 21st Ave, Paterson, NJ*———New formulary contains suggested starting formulations for compounds used in the dyestuff, textile processing, sanitary chemical, soap, cosmetic, metal treating, and maintenance chemical industries.

New laboratory bulletins, also available, cover Continental's line of alkyl sulfates, alkyl aryl sulfonates, alkanolamides and other specialized emulsifiers.

●

TECHNICAL BULLETIN T-6c———*Creamer, Trowbridge & Case, 198 Dyer St, Providence, RI*———Bulletin published by Polyvinyl Chemicals, Inc, discusses NeoCryl BT-4 alkali-soluble acrylic copolymer for textile sizing.

NeoCryl BT-4 reportedly deposits films that are clear, tough, flexible, and unaffected by high humidity yet are readily removed by a mild soap scour. The film shows very strong adhesion to fibers, particularly the newest synthetics (eg, Dacron) and will not embrittle, flake, or become gummy during weaving operations, it is claimed.

Included in the bulletin are descriptions of physical properties and application methods.

●

TENSION PRESSER—*United States Testing Co, Inc, 1415 Park Ave, Hoboken, NJ*—The tension presser was developed to measure the dimensional restorability in fabrics.

The tension presser, which is frequently used in conjunction with USTC's laboratory drycleaning machine and flat bed press, provides a controlled method for determining cleaning and pressing characteristics of fabrics. The instrument is said to meet the requirements of AATCC and ASA test methods.

●

UNITS OF WEIGHTS AND MEASURES (UNITED STATES CUSTOMARY AND METRIC)—DEFINITIONS AND TABLES OF EQUIVALENTS———*National Bureau of Standards Miscellaneous Publication 233 (supersedes Miscellaneous Publication 214), issued December 20, 1960, 20 pages, 40 cents. (Order from Superintendent of Documents, U S Government Printing Office, Washington 25, DC)* ———A 1959 agreement among the directors of National Standards Laboratories of English-speaking nations to obtain uniformity in precise measurements involving the yard and the pound have brought about refinements in the definition of the U S customary units of length and mass, and have made a revised edition of this publication desirable.

The units of length, area, volume, capacity, and mass in the United States are defined in conformity with the 1959 agreement, and the tables of interrelation and tables of equivalents for these units in the metric system and in the U S customary system have been recalculated by automatic computer.

Further revisions include the deletion of the table showing interrelation between bushels and hectoliters and the addition of a more complete table showing equivalents of inches in millimeters.

Foreign remittances must be in U S exchange and should include an additional one-fourth of the publication price to cover mailing costs.

Abstracts———

(*concluded from page 34*)

Courtelle is an acrylic polymer designed to secure good dyeability with basic dyes, an important feature being the weakly acidic nature of the fiber, which affects both the manner of application and the subsequent properties of the dyes. By controlling the pH of the dyebath, the number of acidic groups available for dyestuff, and thus the rate of dyeing, can be regulated.

For basic dyes, an approximate pH of 3-5 in the dyebath is obtained by addition of acetic acid, and, if necessary, sodium acetate. If the depth of shade is reduced, the dyebath pH is also reduced, and no retarding agent is needed even for pale shades. The maximum dyeing temperature is 95-120°C.

Disperse dyes have extremely low substantivity on Courtelle, and are normally used only for pale shades. They are very level dyeing, and selected dyes have good lightfastness. The maximum dyeing temperature is 90-110°C.

Premetallized wool dyes can be applied at 120°C with addition of Glauber's salt.

For the production of whites, sodium chlorite or other chlorine-containing bleaches should not be used. The author recommends the use of a fluorescent whitening agent, Tinopal ANA, which is said to have maximum whitening action and good lightfastness.

New Staley Research Facilities Serve Textile Industry Technology

Extensive facilities for new corn and chemical product developments serving the nation's textile industry are provided in the new Staley Research Center, which was opened May 5 at Decatur, Ill.

Edward H Grosse, head of A E Staley Mfg Co's textile research laboratories, said "the Staley Company's long-established and growing interest in textile industry starch applications is evident in the expanded research facilities, as well as the advancing technology of textiles today."

A "special climate" room in the textile laboratories provides a constant temperature of 70°F and a relative humidity of 65 percent to control these variables in experimental work.

In the equipment room, a specially designed Labline curing oven heats samples up to 400°C, and several Birch Bros laboratory padders simulate mill sizing applications. An American Junior Cascade test washing machine, an Atlas Launder-Ometer for standard washing tests on fabric samples, and a homogenizer for preparing starch size solutions are also provided, along with an operating Staley Jet Cooker system duplicating equipment used in many textile mills.

A Walker Abrader tests abrasion resistance of yarns sized with various formulations and methods, including standard Staley products and potential new warp sizes being evaluated.

An Instron tensile testing unit records elasticity, elongation, strength and break of yarns and swatches. Reflectometers check color change; an Elmendorf unit tests tear strength, and other equipment scorch resistance.

Chairman A E Staley Jr said the 108,000-square-foot Staley Research Center "marks a new era in our Company's growth and progress in which research has played an increasing role for nearly a half-century."

James A Bralley, Staley technical director, said the new Center will stimulate further progress, "particularly in product developments from the Staley starch fractionation process announced early this year, which opens up a vast new area of corn starch applications and potentials for science to explore."

Construction of the Staley Research Center began in 1959. The structure consists of three wings. A four-story central wing houses 138-fully-equipped laboratory units, with modular design for grouping units in work areas and flexibility in future arrangements.

A three-story south wing houses administrative offices and a technical library of some 10,000 bound volumes plus current scientific literature and information services drawing on central libraries. In the two-story north wing, a cafeteria seats 150, and an auditorium for 225 has on-stage provisions for laboratory demonstrations.

Air-conditioned throughout, the building has individual temperature controls in each room.

Other special facilities are provided for laboratory supplies, microscopy, spectroscopy, photography, glass blowing, equipment making, water distillation and distribution, shipping, sample storage and care of glassware.

Advanced scientific equipment includes an electron microscope capable of 1-½ million diameter magnifications. Gas chromotography and infrared spectrophotometry are used to shortcut chemical analysis.

•

Multiple Client Survey of Communist Processes and Product Technology

A technological survey of the European Communist countries will be jointly conducted by Robert S First, Inc of New York, and Petrole-Chimie of Paris. This survey will be based upon a program of field calls in Russia, Poland, East Germany, Czechoslovakia, Hungary, Romania, Bulgaria, Albania, and Yugoslavia.

The objectives of the survey will be to determine if new, unique, or lower-cost products or processes are available for license in the United States. The survey will be divided into six sections: 1) petrochemicals, 2) organic chemical specialties, 3) inorganic chemicals, 4) polymers, 5) pharmaceuticals, and 6) chemical equipment.

This survey is open on a "subscription in advance" basis to interested United States companies. It reportedly will attempt to obtain the following information about each process or product: 1) a brief description; 2) whether it is a patent or "know-how"; 3) the advantages of the product or process; 4) a description of the present or potential market; 5) the availability and the terms of license; 6) the name, address, and telephone number of the proper contact in Eastern Europe.

Further information can be obtained from Robert S First, Inc, industrial consultants, 60 E 42nd St, New York 17, NY, YUkon 6-0325.

BOOK REVIEW

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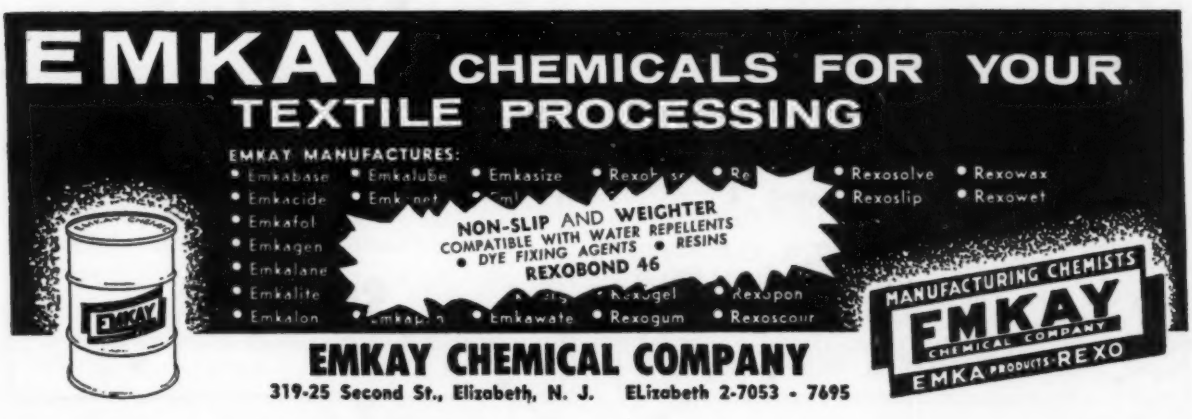
The U S Government, with its many departments, agencies, bureaus, etc, is by far the largest publisher of statistical data in the country. The purpose of this guide is to bring order out of this voluminous output and to make available to those interested in obtaining any type of data a compact, yet comprehensive, reference tool. This volume covers over 2,000 items, including the recurring publications, the statistical series, and the many important one-time publications of statistical value.



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WANTED: EXPERIENCED SUPERVISOR for processing and finishing of tubular knit goods. Eventual placement will be in the South. Write Box No. 166

POSITION AVAILABLE: SALES—TECHNICAL. Must have experience in dyeing and finishing of man-made and natural fibers. Territory to include South Carolina and Georgia. Send complete resume. Write Box No. 169

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POSITION WANTED: MAN WITH EXECUTIVE ABILITY and twenty years experience in textiles both in North and South America, seeks position overseas or in Latin America as superintendent of dyeing and finishing on synthetics and blends. Excellent references. Speak English, French and some Spanish. Write Box No. 159

POSITION WANTED: TO REPRESENT SALES in New York market. Print works. Dyeing and finishing, print or both. Have years of mill experience and sales. Synthetics, cottons, silks. Write Box No. 167

POSITION WANTED: TEXTILE CHEMIST, B.S. Degree, Age 34. Experience: Application research, product development, product improvement, production control in dyeing, printing and finishing of woven, nonwoven and industrial fabrics. Desires responsible job in East or Midwest. Write Box No. 168

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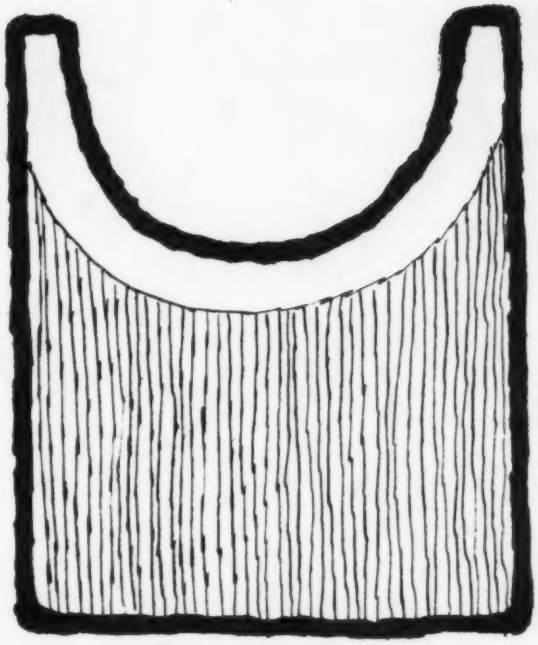

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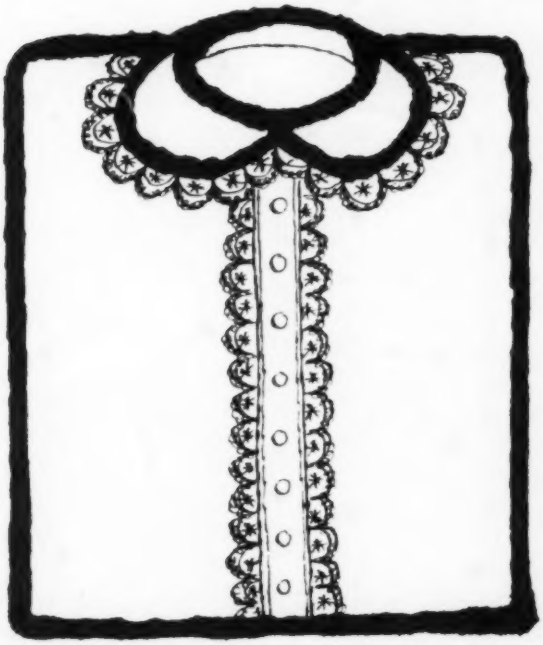

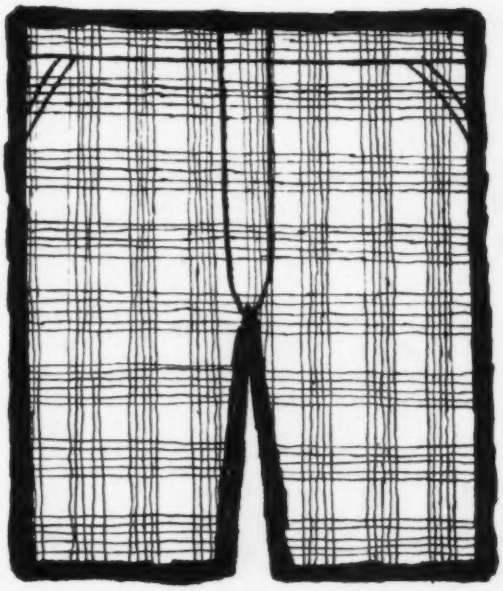

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